INSTRUMENT CONSTRUCTION AND VALIDATION FOR THE
GENERIC ASSESSMENT OF TEACHER EFFECTIVENESS IN READING

BY

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A DISSERTATION PRESENTED TO THE GRADUTATE COUNCIL
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In grateful appreciation for the many years of faith, encouragement, and patience, and for the acts of unselfish interest in my welfare and success which first made my college education possible, I proudly dedicate this study to my grandfather, Scott S. Williams. Thank you, Poppie, for the opportunity you have given me. I shall forever remember your love and kindness and will continually endeavor to be worthy of your belief in me.

## ACKNOWLEDGMENTS

TABLE OF CONTENTS

Abstract of Dissertation Presented to the Graduate Council
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Requirements for the Degree of Doctor of Philosophy

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The issue of whether the acquisition of knowledge or whether
the successful performance of job like task should be the goal of
education provided the rationale for a study to investigate the
level of teachers' competency in teaching reading.

The design of the study focused on the contributions of the
variables of level of training and experience in teaching reading
to the overall level of proficiency in ten generic competencies of
reading instruction, measured in both the knowledge and performance
domains.

Utilizing a set of ten generic teacher competencies, which
research has suggested tend to be associated with success in teach-
ing children to read, two instruments were developed to assess the
knowledge and performance dimensions of these competencies in
teachers.

vii

Data on a population of 144 teachers and students of reading instruction from the State of Florida were used to test the interaction of training and experience, the main effects of training and of experience and the relationship of knowledge scores and performance scores. Additional data on the ability of the instruments to detect growth resulting from directed instruction in teaching reading (measured in pre- and posttest differences), and calculation of instrument reliability were obtained.

Analysis of variance results indicated no interaction of the variables of training and experience in either the knowledge or performance domains. As main effects, neither training or experience possessed sufficient strength to account for differences in subjects' knowledge domain scores, but both variables exerted strong independent influence on the variance in subjects' performance domain scores.

Results support the recommendations that both instruments developed for the study (GATER-K and GATER-P) be utilized in further research aimed at monitoring the level of competence maintained over time and the investigation of the relationship of curriculum to competency acquisition in reading preparation programs and support continuing this assessment in both the knowledge and performance domains.

CHAPTER I

THE PROBLEM

## Introduction

Contemporary curriculum development by such popular authorities
as Jerome Bruner (1960) and Lewis and Meil (1972) embodies in its
theory the basic assumption that the course of learning is essentially
vertical, moving from specific to general, and from an early concentra-
tion on knowledge towards an ultimate end of acceptable ability to per-
form. In actual practice, the accumulation of knowledge is often both
the initial goal and the final outcome of formal education.

Prominent scholars, both ancient and modern, have tended to view
knowledge as the key to education. Bacon (Benham, 1926, p. 14a)
asserted that "knowledge is power" more than 300 years ago. And more
recently, Bruner (1964, p. 129) affirmed that "Action follows from what
one knows." This line of thought is consistent with the common practice
of assuming that the assessment of the knowledge dimension of learning
will prove sufficient to accurately and reliably predict the future per-
formance effectiveness of the graduates of our educational institutions.

Certain rather obvious limitations exist to the above mentioned
assumptions. Respectively, it is not necessarily true that the nature
of all learning and subsequently the curriculum should follow the

form of a vertical spiral. Some aspects of learning may best be approached from general to specific, some may warrant a horizontal approach, and others may require a structure that is as yet unknown.

While Bacon (Benham, 1926) has his position, Huxley (Benham, 1926, p. 176a) believed that "The great end in life is not knowledge, but action." And this other viewpoint is also supported by the proverb, "Knowledge without practice makes but half an artist" (Benham, 1926, p. 799a).

Another limitation seriously challenges the practice of one dimensional assessment of learning. When assessment is limited to the knowledge base, no direct evidence can be offered to indicate the actual level of performance resulting from this knowledge. Likewise, when only performance is assessed, no corresponding evidence can be offered to indicate the depth or range of knowledge that undergirds the specific behaviors observed.

These assumptions and their respective limitations create a parallel set of consequences. The most obvious consequence to these limitations is the potential for failure when the structure of the curriculum is not congruent with structure of the intended content.

Prima facia evidence of this pitfall is provided by the still popular synthetic approach to phonics instruction in the reading curriculum. While many proficient readers received their initial phonics knowledge in this manner (synthetic), which reflects strongly the spiral curriculum approach to learning to read, it is at odds with more natural and efficient strategy of ". . . analyzing major word elements for sound, blending these together, and reaching an

approximate pronunciation of the unknown word which should in turn cue
a meaning association" (Lamb & Arnold, 1976, p. 346).

Altogether too many readers have had to overcome the unnatural
habits resulting from this practice. The acquisition of these habits
is attributable to the interface incongruity between the curriculum
structure and the structure of the reading process to be learned.

Secondly, (whether it is knowledge or action that is desired, or
both, the dimension of automaticity (Fitts & Posner, 1967) that pro-
motes utility in learning is ignored. Thus, the reader who has
acquired the requisite knowledge and the enabling skills may be able
to read, but may never attain a functional level in reading due to the
fact that the spiral approach distorted the reading process and failed
to reach the dimension of automatic processing so necessary to success-
ful performance and self generative development.)

Further perils exist consequent to the situation where lack of
practice and/or obliterative subsumption intervene to distort the
assessment data and render invalid conclusions about the quality and
quantity of instruction that has occurred. (While it is practice that
ultimately leads to automaticity of performance, it is also practice
that can account for the resulting obliterative subsumption of know-
ledge and skills to the point that "the specific items become spon-
taneously and progressively less dissociable from their anchoring
ideas as entities in their own right, until they are no longer avail-
able and are said to be forgotten" (Ausubel, Novak, & Harrison, 1978,
p. 129-30). (Quite obviously, also, lack of practice can lead to the
final extinction of previously acquired learning if the stage at which
the piecemeal learning becomes consolidated has not been reached.)

The above considerations lend strong support to an approach to assessment that as Tyler (1949) suggests needs to include both the cognitive criteria and the behavioral outcomes expected of the learner.

/Reading educators have a history of promoting a multidimensional approach to curriculum instruction, and assessment in the teaching of reading. Notable for this work in the field are Betts (1950), Harris (1970), Durrell (1940), and others who have considered the multiple dimensions of what Powell (1975a) has termed potential, performance, and placement in their overall instructional rationales at the classroom level./

The reading field's record with respect to the curriculum, instruction, and evaluation of its preservice and inservice practitioners, however, has not been so broadly based. /While efforts have been made to devise instruments to assess teacher knowledge in reading (Artley & Hardin, 1971), and others have sought to assess teacher problem solving abilities on reading instruction tasks (Stoll, 1971), and some have even assessed teacher effort in teaching as an estimate of teacher effectiveness (Blair, 1975); a lack of conclusive evidence exists as to the relationships among these variables/(Powell, 1976). /A further reservation is called for when the question of content validity is raised regarding the instruments utilized in the studies mentioned above./

/While previously devised instruments have been found to have a positive correlation with student gains in reading, a lack of evidence exists to verify the validity of the content of these instruments relative to the question, "What knowledge is worth knowing?"/(Powell, 1976, p. 158).

This question has more recently been confronted as an outgrowth of the concern for and commitment to improving education in the basic skills in our public schools. One such effort has produced a set of basic teacher competencies, derived from the research literature, and containing both cognitive and performance dimensions (Powell et al., 1977).

Involvement by the present author in this project lead to the development of a series of task performance activities that have the potential for assessing a subject's competence in problem solving activities typically encountered in classroom instruction and have the distinction of being considered as prerequisites to successful classroom instruction (Powell et al., 1978).

Following upon and extending beyond the precedents of earlier research, the present study will attempt to

1. Assess teacher knowledge and performance capabilities in each of ten purportedly distinctive competency areas of reading instruction.

2. Make some determination as to whether the knowledge base is prerequisite to and predictive of performance in the ten areas examined.

3. Ascertain the effects of training and experience in teaching reading on the level of teacher competency in both the knowledge and performance domains.

4. Explore the potential of the instruments' diagnostic capabilities with respect to the ten areas assessed.

## Assumptions Underlying the Hypotheses

If the concept of the spiral curriculum is a valid one, then increases in the level of teacher preparation should be reflected by corresponding increases in teacher knowledge in a specific field of study.

If knowledge is indeed the fundamental component of the curriculum, then increases in the level of teacher preparation should be reflected in the overall level of teacher competency in performance of the activities associated with the area of specialization.

If there is a corresponding relationship between knowledge and performance in a specific area of specialization, the assessment of either dimension should yield meaningful information as to the status of a subject in the other.

To assess the validity of the above assumptions, the following hypotheses will be tested.

1. Is there an interaction effect of level of preparation and years of experience in teaching reading on subjects' competency scores in either the knowledge or performance domains.

2. Are there main effects of either training or experience in teaching reading on the competency scores of teachers in either the knowledge or performance domains?

3. Is the level of teachers' knowledge in teaching reading related to their level of performance in teaching reading?

## Definitions and Terminology

For the purposes of this investigation, the following terms and definitions shall be considered operational:

1. _Teacher_--a person who is either a student or practitioner of reading instruction or both.

2. _Cognitive domain or knowledge base_--criteria consisting of facts, factors, parameters, procedures, practices, rules of generalizations which must be learned and stored in memory for later use.

3. _Performance domain or performance tasks_--criteria consisting of techniques and processes which must apply and utilize certain cognitive elements in the context of classroom type activities of reading instruction to reach acceptable decisions from among the available alternatives.

4. _Level of training_--a range of zero to nine representing the number of courses of study in reading instruction completed, or the attainment of a State approved certificate to teach reading.

5. _Level of experience_--a range of zero to nine-plus representing the number of years in which subjects have been involved in the professional practice of teaching reading.

6. _Teacher competencies_--a set consisting of fifteen specific elements in the performance domain of reading instruction, and their associated cognitive components, all of which are considered to be essential prerequisites for effective classroom performance in the teaching of reading (Powell et al., 1977).

Rationale

The recent trend in American education has been to move back to the basics. The underlying rationale for this movement has been a general and pervasive disenchantment with the results, in terms of pupil competence, of the multitude of programs and packages for

teaching which have consumed vast quantities of educational resources only to yield students with diplomas and/or degrees, whose ability to perform even the most simple of on-the-job tasks is inadequate.

The popular feeling is that while many things can be taught, what is important to teach and teach first are those knowledges and skills that permit and even assure that persons can perform in the job situation those activities that are expected of them in the role for which they were hired.

From employers comes the cry, "They can't even add," and "They can't read!" or "They can't even fill out the forms!"

While it is appropriate for the employer to voice these dissatis- factions, it must ultimately be decided exactly what is important to know and what is required to be done on the job in order to quiet these objections.

In the case of skilled and professional workers, one seemingly sound approach is articulated by Bode (1927, p. 98) who observed:

> The activities in connection with which a subject matter may be used are analyzed to discover exactly what the individual is to do and then the subject material necessary to assist in the performance of these activi- ties is collected and organized. . . .

( Quite obviously in reading education, the goal of instruction is to produce pupils who can read, and the goal of preservice education of reading professionals is to teach those knowledges and skills that eventually produce this outcome. In considering this approach to the problem, two very important concerns arise.) First, what are the activities required on the job and does the demonstrated ability to perform these activities insure their use in the job role, and

ultimately the check on the whole system is decided by the outcome: "Is the job being done to the satisfaction of the employer?"

Previous studies that sought to answer these questions have yielded answers that are both helpful and limited. In attempting to provide a rationale for her study, Stoll (1971) constructed an instrument whose design was aimed at assessing teacher problem solving proficiency in the teaching of reading as a means of providing some answers to the concern for the vital role that previous studies (Ramsey, 1962; Harris, 1969) had shown that the teacher plays in the final outcome of pupils' growth in learning to read.

While her approach did provide an alternative method of assessing teacher competence, and while her instrument did demonstrate a measure of concurrent validity with respect to pupil gains, and while it did incorporate the dimension of problem solving in the task of teacher assessment, it failed to provide the diagnostic function that is needed in order to link assessment to subsequent instruction to improve performance on the instrument and in the classroom. Another shortcoming of interest to this study is the confusion associated with the overlap in the test's subtests with respect to determining the domain (cognitive or performance) that is represented by the items.

A cognizance of the outcomes of these previous efforts helped guide the process of instrument development in the present study. The intent was to avoid replication of these aforementioned limitations.

Beginning with the need to determine what skills are considered to be basic to the process of learning to read, a three stage model of literacy emerged (Powell, 1975b). This model provided a framework for

the organization and analysis of the reading process into meaningful stages which could then be examined to ascertain components involved at each of the three levels (Powell et al., 1976). This involved a rather extensive review of the literature to isolate those components which seemed to underlie differences in the performance outcomes of learners at the various stages of learning to read.

Next it was undertaken to determine the corresponding teacher competencies that the available literature suggested were necessary for the teacher to possess in order to perform the activities of the classroom that could produce the desired results in students. Out of this phase of the project (Powell et al., 1977) came the specifications for the teacher competencies in objective format with both cognitive and performance dimensions identified.

(It was at this stage that the performance task approach, utilizing the concept of simulated instructional situations that Stoll (1971) had employed, was merged with the content validated specificiations of Powell et al. (1977) to yield an instrument that held promise for assessing a teacher's competence in the essential activities of the job of teaching reading.) Utilizing the cluster format, which groups the corresponding objectives, provided a diagnostic dimension that could be used to identify both the general and specific strengths and weaknesses existing in the professional fabric of a teacher. When outcomes on the performance instrument are compared to outcomes on a similarly organized cognitive instrument, the relative relationships between the competence level of teacher's knowledge and teacher's performance should be assessable.

CHAPTER II

RELATED RESEARCH

The role of knowledge as a factor influencing the level of competence in task performance has been debated for many centuries. The earliest positions evolved from philosophical perspectives which lacked supportive data and were advanced by respected "thinkers" of the day. With little more than a reputation and a solid logical framework to support him, Francis Bacon is said to have proclaimed that "Knowledge is power" (Benham, 1926, p. 14a), and while no other equally profound quotations exist from the period to counter this position, noteworthy intellectuals have foreseen that knowledge alone could not insure satisfactory performance.

According to the non-Biblical proverb, "Knowledge without practice makes but half an artist" (Benham, 1926, p. 799a) and the theorist Huxley (19825-1895) extended this latter concern by proposing that "The great end in life is not knowledge, but action" (Benham, 1926, p. 176a).

Eventually the factors of knowledge and performance had to be considered an issue of importance with potential impact on the process of education, both in the present and in the future. As this concern evolved, attempts were made to examine the content of education (knowledge) relative to the goals of education, with the result being the development of taxonomies of objectives which served to further

specify what the term "knowledge" really meant. The whole concept of examinations, as we know them, has behind it this rationale.

Specifically, the field of reading education has seen the development of a position that explains the variance in teacher effectiveness from the position that there exist certain specific, identifiable, and assessable knowledges whose acquisition is necessary and related to the teacher's performance and ultimately to student gains in learning to read, and that one way to monitor and predict this effectiveness is to examine the level of content knowledge that exists among preservice and inservice professionals in reading.

The logical outcome to this position has been to develop instrumentation capable of reliably and validly measuring this knowledge on a differential basis. As early as 1971 (Artly & Hardin, 1971), a test became available that sought to measure the knowledge of persons involved in reading instruction activities. This instrument claims a .92 reliability index overall, and has purported validity (Kingston, Brosier, & Hsu, 1975) for the knowledge domains of the directed reading activity, instructional goals, diagnosis and evaluation, reading comprehension, reading readiness, and word recognition skills (Powell, 1976).

Concurrent to this effort, Stoll (1971) took the position that reading instruction was more a matter of problem solving and undertook to construct and validate an instrument to assess teacher problem solving ability on simulated classroom teaching skills tasks. In doing so, Stoll created a reading-specific assessment instrument that had underlying it the conceptual framework introduced by Turner and Fattau (1961), who had focused on the assessment of specific classroom teaching skills in the area of mathematics.

An earlier work by Wade (1960) had also considered this approach, but left some serious questions relative to the appropriateness of procedures used in scoring the instrument and further consisted of a rather narrow view of the reading teacher's problem solving role (Stoll, 1971). However, the model developed by Wade did serve as a guide to subsequent studies.

One such study was conducted by Richard Burnett (1961). While noteworthy for its attempt to measure a teacher's diagnostic problem solving ability on interrelated problems, much like those of the actual classroom, this same approach resulted in poor task differentiation and was naturally of little diagnostic value.

A subsequent investigation by Bradtmueller (1963) utilized an updated version of Wade's (1960) instrumentation to examine relationships that might exist between student teaching experience and pre-service methods courses and a teacher's problem solving ability on reading instruction tasks. (The outcomes of this study found significant differences between the level of skills in problem solving by supervising teachers and the general elementary teacher population studied, and between the effects of the student teaching experience and the problem solving efficiency of student teachers over the time of their internship) While the questions of the effects of supervising teacher's skill on her student teacher's skill in problem solving over the course of the latter's internship were examined, and the relationship between grade level and student teacher's attainment in problem solving proficiency was studied, as was the relationship between grade level and supervising teacher's problem solving skill,

and the differing contributions of the student teaching experience and the preservice methods courses, no significant relationships, inter-actions, or differences were found (Stoll, 1971).

Speculation by Stoll (1971) and an earlier comment by Turner (1965) raise serious question as to the validity of the instrumentation used in the Bradtmueller study (1963), and it is this flaw that is suggested as the reason for the lack of more conclusive results.

An attempt to deal with these instrument deficiencies was initi-ated by Brown (1968) and resulted in a Form C of the earlier Teacher "Tasks in Reading"(TTC) created by Wade (1961) and the "TTC, Form-B1" revised by Bradtmueller (1963). This investigation incorporated pupil gain scores into the validation process and utilized twenty-one teachers from a remedial reading summer program as its population. Results were disappointing as only one area of pupil gain (vocabulary achievement) produced any significant relationship to differences in teacher performance on the "TTR, Form C" and this difference held only for total score comparisons. Some differential in teacher task per-formance (tasks 3-c, 4-c, and IR-3) did result when pupil scores in vocabulary, comprehension and total reading were used as criteria, but the general conclusion of the investigator was that further revisions were needed in the "TTR, Form C" before it could be utilized to measure teacher effectiveness.

Perceiving the need to extend the groundwork laid by these early studies, Stoll (1971) undertook the construction and validation of an instrument designed to measure teacher problem solving proficiency which would feature improved reliability and validity and would also

have an equivalent form available. Her aim was to construct an instrument for the purpose of differentiating teacher's problem solving proficiency on reading instruction related tasks overall, and to include a diagnostic character to the instrument such that subskill areas of strength and weakness could be identified as an aid to future assessment and planning of instructional experiences for reading teachers at both the individual and institutional levels.

Her instrument consisted of nine subtest sections selected to represent the content areas ". . . considered by experts in the field, to be focal to the teaching of reading" (Stoll, 1971, p. 24).

Field testing, analysis of preliminary results and modifications yielded the instrument "Problems in the Teaching of Reading, Forms G and G, Revised." The instrument was administered to a population of 455 pre- and in-service teachers with differing levels of training and experience, representing several universities and differing geographical locations.

An attempt to overcome an earlier investigation's shortcomings in scoring of responses was provided by the use of the criteria of consistency which yielded a correct response that was derived from the problem information, processed according to and consistent with the rationale accepted by experts in the field and/or supported by research.

Reliability data obtained from random samples of the total study population yielded a .96 coefficient of equivalence overall, with subtests coefficients ranging from a low of .08, to four subtests with coefficients of .88 or higher, and lead to the conclusions that

the instrument was both internally consistent and that the alternate forms were similar.

/ Validity was assessed via factor analysis of the subtests in the instrument and via correlating subtests scores against measures of I.Q. and verbal aptitude. Results indicated that the tests correlated with intelligence, but were obviously measuring something additional and that subtests measures were related but distinct in their sub-skill assessment./

Additional analysis indicated the instrument differentiated over-all between both the factors of level of and type of preparation.

Considering the results obtained, Stoll concluded that the problem solving approach may ". . . indeed provide a useful diagnostic tool for indicating teacher weaknesses in reading teaching skills. . ." (Stoll, 1971, p. 105), and that ". . . skill in the areas tested by this instrument can be increased with training," (Stoll, 1971, p. 100) and further suggested that training as by Powell (1968) can increase skill in all areas tested by the instrument.

Recognizing the potential of these early efforts in the assess-ment of teacher competence (Artly & Hardin, 1971; Stoll, 1971), Powell (1976) prepared a three-stage model of proficiency in teaching read-ing and undertook an investigation to test his model.

Two of the model's components--the acquisition of knowledge and transfer/problem solving--were proposed as being measurable via a paper and pencil test with the third component--utilization of know-ledge--to be assessable via observation and rating scales.

Utilizing the instrumentation available at the time (Artly & Hardin, 1971) and (Stoll, 1971), he examined the relationship between teacher knowledge of reading and the teacher's ability to solve problems in reading. Involving a population of 36 reading resource teachers with experience ranging ". . . from one year to many years in teaching, and the level of training varied from just over a bachelor's degree to a few with several graduate hours in reading past the master's degree" (Powell, 1976, p. 156), he found a significant relationship ($R = .63 @ .01$) between the total knowledge score in reading and the ability to solve classroom reading problems. Yet many of the subtests correlations were low and/or not significant. He attributed this to the number and type of items in the two instruments relative to the common areas of focus. This interpretation was supported by the results of his factor analysis of the 22 variables examined. The analysis revealed eleven factors which accounted for 95 percent of the total score variance, but only two factors emerged from the Artly-Hardin (1971) "Inventory of Teacher Knowledge of Reading" while Stoll's (1971) "Problems in the Teaching of Reading" produced eight identifiable factors. This study's population was considered more homogeneous than that of Stoll's original work (1971) in which only five factors emerged and lead to the conclusion that the "Problems in the Teaching of Reading" had established its power of diagnosis in the areas measured and was reflecting ". . . the subjects' ability to generalize upon their knowledge" (Powell, 1976, p. 158).

Contrary to this, the Artly-Hardin "Inventory of Teacher Knowledge of Reading" ". . . offers no diagnostic and prescriptive

qualities . . ." and "little in the way of predictive power as to who will apply the knowledge they possess" (Powell, 1976, p. 158).

Yet the few areas of similar focus between the two tests do offer ". . . clear evidence that there is a significant and marked relationship between the teacher's knowledge in a given performance area and his/her ability to solve problems in that area" (Powell, 1976, p. 158).

CHAPTER III

METHODOLOGY

## Instrumentation

The collection of data for the study was accomplished via two
instruments developed by the author. The two tests, GATER-K and
GATER-P, were administered to subjects to obtain a measure of their
competency in the knowledge and performance domains of teaching reading.

Both instruments have as their content basis the "Teacher Compe-
tencies and Indicators for Learning" developed by Powell et al. (1977).
Both instruments involve a pencil and paper format test utilizing a
machine scoreable answer sheet, consist exclusively of multiple choice
items, and both assess the same set of competencies. The process of
instrument development and validation was similar, although not com-
pletely parallel nor concurrent with respect to time.

For the sake of convenience and accuracy, a historical perspec-
tive on the instruments' development will be followed.

## Instrumentation in the Performance Domain

In conjunction with an ongoing research grant for the Florida
Department of Education involving the "Project to Improve Education
in the Basic Skills," the present author was commissioned to develop
a set of items to assess teacher competence in the performance domain

19

for nine of the fiteen teacher competencies identified by Powell et al. (1977).

The task involved reviewing the utilization of the problem solving concept as previously developed by Turner and Fattu (1961), Wade (1960), Burnett (1961), and Stoll (1971). From this review a format was established for the assessment of the performance domain. The format casts the examiner in the role of a teacher of reading. For each area assessed, a set of directions is provided, and a context established wherein the teacher is confronted with situations typical of those found in actual classroom settings. In selecting an answer from the available alternatives, the subject must analyze and process the information provided in each context to arrive at a decision. The criterion for the correctness of each decision is that it must be considered the most appropriate and would be defensible according to the known and accepted knowledge and/or theory in the field of reading instruction.

To achieve content validity overall and within each of the competencies, the three step approach recommended by Gronlund (1977) was followed wherein for each competency (1) the topics and outcomes were identified, (2) a table of specifications was constructed, and (3) items for each specification were developed.

It was anticipated that from this original bank of items subsequent field testing would establish the differential strength of certain items over others, and the stronger items would then be selected for further use. Therefore, a criteria of between five and ten items per competency was set to insure an adequate pool of items for later selection.

Each item, while specifically different from each of the other items involving the same competency, was designed to require the utilization of similar techniques and processes in order to reach the appropriate decision.

Also in the course of this process, it was determined that competency #10, "Devise teaching strategies for aiding students to acquire a recognition vocabulary" had two distinct parts. These two parts, "phonic analysis" and "structural analysis," would therefore be assessed in two separate sections, each with its own set of directions.

Utilizing only original material, a bank of ninety-two items was developed and published as a part of ". . . Indicators of Teacher Performance in the Basic Skills, Technical Report No. 4," Powell et al. (1978).

Concurrent with this report, selected competency items were field tested in conjunction with teaching activities at the University of Florida during the Winter Term, 1978, and the Spring Term, 1979. While a problem with two of the items was detected during these limited field tests, the items as developed showed promise and were subsequently committed to more thorough field tests.

Pilot Study 1

At the conclusion of ten weeks of instruction in a basic course in "Techniques of Teaching Reading" taught by the present author, the twenty-four students enrolled were administered all ninety-two of the performance domain items during a two-hour exam period. Their responses were recorded on a separate answer sheet and all items

were hand scored.  Comments from the students regarding some of the
items were solicited and noted.

Consistent with the results of the preliminary field tests, the
comments of the students and the results of this study indicated that
two of the items were totally inappropriate for further inclusion.
These items involved subjects listening to tape recordings of stu-
dents' oral reading to determine functional reading levels for place-
ment in reading materials.  In both instances the quality of the tape
recordings was unacceptable in that they could yield different answers
depending upon the setting acoustics during different playbacks.  Thus,
these two items were dropped from further analysis.

Analysis of the remaining ninety items produced an overall reli-
ability estimate (KR-20) of .94, with a standard error of measure-
ment of 4.07, thus indicating a strong internal consistency among the
items.  A split half reliability estimate was also calculated by
". . . scoring the odd items and even items separately and then corre-
lating the two sets of scores" (Gronlund, 1977, p. 140).  This procedure
provides data on the internal consistency of the test and can also be
used to gather some indication of the consequent drop in reliability
expected when the length of a test is shortened.  This produced an esti-
mate of .89 for Part I and .91 for Part II.

The ten individual subtests were also subjected to an analysis of
reliability.  The KR-20 estimates ranged from .49 to .86 and are sum-
marized below.

| Subtest 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| KR-20 .49 | .59 | .73 | .53 | .86 | .85 | .88 | .80 | .83 | .84 |

The distribution of item responses, item difficulty, item discrimina-
tion index and point biserial correlation of items to total scores was

calculated for each of the 90 items included in the above analysis, and these data appear in Appendix C.

The results of this analysis lead to the formation of a forty-five item version of the test, maintaining the original format in all respects and reducing each of the competencies by approximately 50 percent of their original number of items.

## Pilot Study 2

The now shortened performance instrument was then administered to a group of thirty-three students upon completion of a basic course in reading instruction taught by the present author during the Winter Term of 1979. The same procedures of analysis noted above were performed on these data to verify the integrity of this shortened version of the test.

The resulting KR-20 reliability coefficient was .73, with a standard error of measurement of 2.41. The coefficients for the ten subtests are summarized below.

| Subtest | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|-----|-----|-----|------|------|-----|-----|-----|-----|-----|
| KR-20 | .19 | .57 | .68 | -.03 | -.04 | .74 | .39 | .45 | .38 | .15 |

The distribution of item responses, item difficulty, item discrimination index and point biserial correlation of items to total scores was calculated for each of the 45 items and appears in Appendix C.

In some of the subtests the drop in size of the KR-20 coefficient was larger than anticipated from the proportional reduction in the number of items per subtest. However, it should be noted that a careful review and consideration of the content and instructional focus of the reading course completed by subjects prior to this pilot administration

offers an explanation of the two very small and two small negative reliability estimates obtained for this group.

Gronlund (1977) notes in his discussion of the methods of determining reliability that both the reliability coefficient (KR-20) and the standard error of the estimate require score variability. Likewise he goes on to point out that despite numerous attempts, no satisfactory method of estimating the reliability of criterion referenced mastery tests has yet been proposed. Both points are germane to the discussion of these results.

In all four of the subtests under discussion (1, 4, 5, and 10), very high mean scores on one or more of the items with no more than five items involved in each subtest and/or subsequently small item variances will result in very low or negative reliability coefficients when in actuality the consistency of subjects' scores over the items is really rather high. Thus, this seeming contradiction is a result of the statistical procedures used to calculate the coefficients.

Also as mentioned earlier, the situation, as in this case, wherein subjects' instructional experience creates a high degree of competence in these tasks has the result of transforming what would usually be a normative assessment into a criterion-referenced mastery subtest to which the norm referenced reliability procedures would be inappropriate.

Therefore, the overall strength of the subtests and the total test's KR-20 coefficient warranted confidence in the instrument. However, experience in administering the instrument and comments from several of the student respondents lead to a revision of the order of

the subtests, and continued displeasure with the quality of the tape recordings used in Subtest 3 resulted in a rerecording of two of the passages using different children as readers without changing the content or the resulting correct answer and the reediting and electronic enhancement of the voice quality in the tape.

The resulting instrument was then named GATER-P for "Generic Assessment of Teacher Effectiveness in Reading - Performance domain," and it is this form that was utilized for the present study and appears in Appendix B.

## Instrumentation in the Knowledge Domain

Employing the definitions previously offered, the knowledge domain test was developed to assess those facts, procedures, rules and generalizations that best and most generically represented the specific objectives enumerated by Powell et al. (1977) as underlying the competencies in the knowledge domain.

As with the performance domain test, a table of specifications was developed whereby each of the ten competency areas represented by GATER-P would have an equally represented set of items in the knowledge domain test. The items themselves were drawn from a basic bank of items previously used in instruction and assessment of students enrolled in basic reading methods courses. These items were modified as necessary to fit the rationale and format of the overall test and in virtually all of the competencies new items were developed to achieve the desired number of ten items per competency.

Subsequent to initial item selection and development, the proposed subtests, along with the statement of the competency being assessed, were reviewed by two independent experts in the teaching of reading. The combined professional experience of these two experts

includes years of university teaching in the field of reading a multi-
tude of professional articles and papers, and editorial and leadership
positions on several boards of regional, state, and national reading
organizations. Their review was part of the process of insuring the
overall content validity of the items to the objectives, the appro-
priateness of the answer choices and correct answer, and the generic
character of the knowledge content as representative of the overall
knowledge and practices in the field, and freedom from bias favoring
the views of any one school of thought or institution's curriculum
over another. As a result of these independent reviews, many of the
items and two of the subtests underwent extensive alterations before
receiving a final clearance.

After completing all revisions, the items were then systematically
intermingled among each other in order to evenly distribute them across
the whole of the test and still provide a convenient organization for
hand scoring and diagnostic analysis. The complete version of the
resultant test was named GATER-K for "Generic Assessment of Teacher
Effectiveness in Reading, Knowledge domain" and appears in its com-
plete form in Appendix B.

This test, unlike its performance domain counterpart, received
no pilot testing before inclusion in the study. Therefore, no pre-
liminary estimates of its reliability are included here, but appear
instead in Chapter IV along with the other results of the study. A
complete summary of the distribution of item responses, item diffi-
culty, item discrimination, and point biserial correlation of items
to total test scores appears in Appendix C.

## Populations

In addition to the two groups of students involved in the two
pilot test administrations previously described, one hundred forty-four
subjects involved in some way in reading education participated in the
study. All subjects involved were either working in the school systems
of or attending college in the State of Florida, but their backgrounds,
training institutions, and levels of training and experience were
diverse.

Sixty of the subjects were engaged in undergraduate or graduate
coursework in reading instruction at five different universities within
the State at the time of testing. Eighty-four subjects were practicing
teachers with varying experience and not all of whom were involved
either presently or in the past in teaching reading, but all of whom
were participating in reading inservice at the time of test administra-
tion. A listing of the participant groups is given in Table 1.

/In collecting data for the study all participants were asked to
record their number of years of teaching experience (0-99), years of
experience teaching reading (0-9), degree level (freshman-doctoral),
field of specialization (major), and whether or not they held certifi-
cation in the teaching of reading. Data on these factors are reported
in Appendix D./

One group of college undergraduates (n = 23) was utilized twice
in certain of the reliability comparisons and in the analyses involv-
ing the pre- and posttest scores.

## Collection of Validity Data

Having previously considered the need to establish content
validity in the development of the two assessment instruments des-
cribed above, of paramount concern in the collection and treatment

Table 1

Description of Groups Comprising the Total Population of
Subjects Tested During the Study

---

Preservice students enrolled in a basic reading methods course
(University of Florida), tested prior to instruction..............23

The same preservice students described above, tested upon com-
pletion of ten weeks instruction...................................23

Graduate students enrolled in a reading seminar focusing on
theory and research, after completing six or more courses in
reading instruction................................................09

Teachers from Pasco County, Florida, currently teaching reading
in an elementary school with experience in teaching reading
ranging from two to nine plus years................................07

Graduate students at the University of Tampa, Florida, enrolled
in a course in diagnosis of reading skills after completing at
least two previous courses in reading..............................08

Undergraduate seniors majoring in elementary education at the
University of South Florida who were tested upon completion
of their second course in reading methods..........................14

Undergraduate and graduate students taking a course in clinical
remediation at Jacksonville University, with at least one prior
course in reading and no experience in teaching reading............06

Title I reading teachers from Alachua and Duval Counties,
Florida, who possess reading certification and varying
experience in teaching reading.....................................08

Practicing teachers from Duval County, Florida, with varying
levels of experience and training who were participating in
the District's reading inservice program...........................55

Practicing teachers from Clay County, Florida, enrolled in a
content area inservice reading course tested prior to instruction..14
                                                                   ────

of data in the study was the need to explore the issues of construct and criterion validity.

The former according to Gronlund (1977) centers around the ability of test performance to be explained in terms of certain psychological attributes. In the present study these attributes would take the form of knowledges and decision strategies in the teaching of reading. Further, the study theorized that both of these attributes were related to the variables of professional training and experience in teaching reading; and specifically that there might be an interaction of these variables that would be reflected in differences in subject's test scores, once it had been established that each of the two tests was capable of measuring a difference in subjects' level of competency.

<u>Validity Study I</u> - Differences in Tests' Scores Attributable to Instruction

A portion of the population included in the overall study was twenty-three students enrolled in a basic course in "Techniques of Teaching Reading" at the University of Florida during the summer of 1979. The content of this particular course was essentially the same as that of the course under which the pilot testing of the performance instrument was conducted and the curriculum was specifically consistent with the objectives and competencies to be measured by the two tests.

This course met for two hours, twice a week, for ten weeks. The pretest was administered during the first class meeting and the post-test was given during a class period during the tenth week of the term. While generally familiar with the focus of this study, the course's instructor had no opportunity to review any of the items on the tests until after the posttesting session was completed.

Of the twenty-seven students attending at the pretesting class session, twenty-three of the same students were also present for the posttesting session, and an additional five students took the post-test but had no pretest scores. Only the twenty-three students with both a pretest and a posttest score were included.

The raw scores on the pre- and posttests were then subtracted from each other for both instruments GATER-K and GATER-P and a t-test was performed on the mean differences of the scores. A failure to detect a significant difference in the pre and posttest means would place confidence in the instruments' content and construct validity in jeopardy.

<u>Validity Study II</u> - Differences in Tests' Scores Attributable to
                        Differences in Training and Experience

The second theoretical construct at issue in the study, and the one of paramount importance, was the hypothetical contributions of the variables of training and experience to the teachers' overall level of competence in both the knowledge and performance domains.

At issue here is the importance of these two elements and/or their interaction in the professional life of a reading teacher with regard to the generic competencies necessary to effective instruction.

For this portion of the study, the entire population of subjects reported earlier was included. For the group of subjects involved in Validity Study I, reported above, only the scores obtained on their posttest were included.

The resulting one hundred and forty-four teachers were asked to encode on their answer sheets information regarding their experience in teaching reading, the number of reading courses completed and their

major area of certification, with certification in reading being a classification that superseded all other certifications.

A combination of theoretical and statistical concerns interplayed to arrive at a set of levels for each of the variables of training and experience. The intent was to permit the examination of differences in competency levels during the early stages of professional development and monitor competence levels over a reasonable time. An additional concern was that each level should contain an adequate number of subjects to render statistical analysis possible and meaningful.

While many different combinations of levels could have been established, and results might be different under different combinations, the study's originally proposed set of levels was maintained throughout the statistical analysis.

For the variable of training, subjects were grouped into categories according to the following criteria: level "zero" contained subjects with no prior training in reading instruction; level "one" contained subjects with one course completed or nearly completed at the time of testing; level "two" contained subjects with one course completed and a second course completed or nearing completion and no third course started; level "three-to-five" contained subjects with at least three courses, but no more than five courses completed or nearing completion; level "six-to-nine-plus" contained subjects who had at least six courses in reading instruction completed or nearing completion, but without having achieved the level of reading certification; and the final level contained only those subjects who had acquired certification to teach reading.

For the variable experience, subjects were grouped into categories according to the following criteria:  Level "zero-years" contained subjects who had never taught reading and who were not currently involved in the teaching of reading; level "one-to-three-years" contained subjects who had taught reading for one complete year or were currently teaching their first year of reading (all were tested during the second semester of the school year), and those who had completed or were completing their second or third year of teaching reading, but who had not begun their fourth or more years; level "four-to-six-years" contained subjects who had completed or were in their fourth year, fifth year, or sixth year of teaching reading, but who had not begun a seventh year; level "seven-to-nine-plus" contained subjects with more than six years of experience in teaching reading.

To explore the hypothesis that subjects' mean scores in the knowledge and performance domains, as measured by GATER-K and GATER-P respectively, were influenced by the level of their training or experience or the interaction of these two variables, an analysis of variance procedure was constructed and performed utilizing the General Linear Models Procedure provided for in the Statistical Analysis System (Helwig & Council, 1979).  Since this procedure provides information only on whether the means of the subjects at the different levels of these variables differ significantly from each other, and not on which means were different, additional post hoc multiple comparisons were planned and conducted among the means of variables whose results on the Anova procedure indicated the presence of significant differences in those means.

Also, two decisions were made regarding the procedures to be followed in conducting these analyses. First, since the nature of the design prevents obtaining an equal number of subjects in all cells, and since this situation of unequal n necessarily introduces a confounding effect into the analysis, and since the inclusion of each term into the solution equation costs power in degrees of freedom in the F test, each of the three hypotheses would be tested separately and hierarchially. A failure to achieve a significance on the interaction term on the first test would result in a subsequent analysis of variance procedure excluding the interaction in order that the variance attributable to the interaction could be used in the subsequent F tests on the main effects variables.

Secondly, since the situation of unequal n would also affect the outcome of the post hoc analysis of differences in means, the comparisons on cell means would utilize the least squares procedure. This approach in essence compares the values of the cells' means that actually exist after the variance due to unequal numbers of subjects in each level of the variable has been extracted from the cells. It should also be noted that both of the procedures outlined above were made in the interest of improving the interpretability of the results.

Validity Study III - Relationship of Subject's Knowledge and Performance Domain Scores

The third and final hypothesis to be tested in the study was designed to assess the degree of relationship that exists between the two domains of knowledge and performance in teaching reading.

For the purposes of this study, scores of the entire population, again excluding the 23 pretest scores, on the knowledge domain instrument were used to predict their scores in the performance domain.

The practical reason for this test was to determine the degree of variance that could be attributed to subjects' differing levels of knowledge as opposed to the variance that was explained by the variables of training and experience, and to provide a validity coefficient that would address the criterion related concern that while both tests should be positively and significantly related, one test was not an equally good and sufficient substitute for the other (Gronlund, 1977).

In addition to the F statistic computed to determine the relationship between subjects' scores on the two tests, the Pearson product-moment correlation coefficient (r) was computed to express the degree of relationship between subjects' scores and a corresponding $R^2$ was computed to provide an indication of the amount of variance in subjects' performance scores that could be explained by their scores in the knowledge domain.

The results of all statistical procedures described in this chapter are reported and discussed in Chapter IV.

Limitations

Typically, investigative studies are subject to limitations arising out of the real and practical constraints that occur in the operationalizing of theory. The present study is no exception. Therefore, the following limitations are noted and acknowledged as deserving of mention.

In selecting the final content of the two assessment instruments used herein, the present author acknowledges that despite all of the care and consideration that went into their development, some

potentially pertinent cognitive criteria are not represented, and
that other possibly appropriate performance situations and contexts
were omitted. Although guided by the Table of Teacher Competencies
(Powell et al., 1977) appended herein, the judgement of the author
prevailed in the construction of both the cognitive criteria items
and the performance domain situations.

While the intent of the study is to assess the level of know-
ledge and performance possessed by teachers of reading, for the
expressed purpose of ascertaining the level of competence in perfor-
mance of the tasks of teaching reading, and the contributions that
knowledge makes in this development, there can be no guarantee that
competence as measured herein will find its way into daily practice
in the practical environment of the classroom. But it can be
asserted that all due care was observed to construct cognitive items
that manifested both the qualities of fundamentality and culmination
with respect to knowledges sampled, and all due effort was extended
to create situational contexts for performance testing that are both
credible and typical of the actual decisional contexts that surround
the practitioner in the public schools today.

Thus, while it is not guaranteed that the level of competence
established via the instrumentation in this study will be or is
being utilized in the public school setting, and while no direct
validation of the effect of the competence on pupils' reading develop-
ment is attempted, it can be ascertained whether the prerequisites to
effective instruction at two levels of assessment (cognitive and per-
formance) have been achieved.

/Overall, generalizability of results beyond the range of the study's population characteristics is acknowledged to be inappropriate and highly tenuous./

The lack of significant differences among the level of preparation groups utilized in this study does not categorically exclude the possible validity of this construct, as differentials may exist at levels not represented by the grouping strategies in this study.

Finally, the generalizability with respect to the outcomes of the hypothesis which seeks to investigate the relationship of knowledge to performance in the area of reading instruction (#3) must of necessity be limited to the area of reading instruction in general and to the competencies incorporated into this study, as partial rationale for the study acknowledges a potential exception to this basic construct of education, and in any case is obviously and prima facially limited to the scope of the contents and constructs included herein.

CHAPTER IV

RESULTS OF THE STUDY

The study addressed itself to three research hypotheses. A
restatement of these hypotheses is given below.

Hypothesis 1:

There is no interaction effect between the levels of
subjects' preparation and years of experience in teaching
reading on their competency scores, as measured by GATER-K
and GATER-P, in either the knowledge or performance domains.

Hypothesis 2:

There are no differences between the total competency
scores, as measured by GATER-K and GATER-P, in either the
knowledge or performance domains of subjects at any of the
levels of the main effects variables of training or exper-
ience in teaching reading.

Hypothesis 3:

There is no significant statistical relationship between
the levels of subjects' knowledge in teaching reading, as
measured by GATER-K, and their level of performance in teach-
ing reading, as measured by GATER-P.

Validity of the Instruments

As reported earlier, considerable care was taken in the construc-
tion phase of the instrumentation. The instruments' contents were

based upon the research-supported generic competencies specifications developed by Powell et al.(1977). A table of specifications was employed during item development to insure an adequate and balanced distribution of the items relative to each competency measured.

The knowledge domain test was subjected to preliminary field testings, wherein the results were utilized in the revision of the test from its original 92 items, to the 90 items used in the first pilot study. Pilot Study One was conducted to produce data on each of the 90 items which would serve as a basis for reducing the test to a 45 item format. Once reduced, this shortened and revised instrument (GATER-P) was administered in the second pilot study to provide reliability data on the total test and each of the 10 sub-tests.

The 100-item knowledge domain test (GATER-K) was subjected to a series of expert reviews in its developmental stages. While no pilot tests were performed on this instrument, these critiques guided a series of revisions to correct item and subtest deficiencies. This precluded the necessity of deleting any of the items.

Thus, a certain degree of assurance exists that both instruments, as used in the study, were valid with respect to the content they purported to measure.

However, another important step in instrument validation involves determining that an instrument can detect and measure differences in the competency levels of subjects that can be anticipated according to certain theoretical constructs. One method of establishing this aspect of validity, suggested by Burnett (1961), involved an analysis of the tests' ability to detect changes in groups of subjects'

scores whose level of competence would be assumed to change as a result of direct instruction in teaching reading.

The analysis involved one set of subjects contained within the general population of the study who were drawn from a university class in "Techniques of Teaching Reading." Both instruments (GATER-K and GATER-P) were administered to the group (n = 23) prior to and upon completion of the course of instruction. A $t$ test was performed on the data from these two administrations. Results indicated that the differences in the means for the group's pre- and posttest scores were significant beyond the .01 level. Table 2 shows the mean score comparisons for the group.

Table 2

Mean Differences, Variances and $t$ Values for Subjects'
Pretest/Posttest Scores

| Group | n | $\overline{d}$ | $s^2$ | t | p |
|-------|---|----|-----|---|---|
| Knowledge | 23 | 32.61 | 110.94 | 14.84 | .01 |
| Performance | 23 | 3.13 | 26.3 | 2.92 | .01 |

Since significant differences in mean scores from pre- to posttesting on both the tests are shown to exist, the instruments GATER-K and GATER-P have demonstrated their ability to detect growth in each of the domains that can be attributed to instruction.

Reliability

Both instruments were subjected to a Kuder-Richardson Formula (KR-20) to obtain a measure of their reliability as it relates to the

internal consistency of the tests. Both domains and each of the ten subtests in each of the domains were analyzed for their reliability. Most noticeable in the total test (Tot-K and Tot-P) reliability coefficients, and also apparent in the subtests (K1-K10 and P1-P10), there is a predictable increase in the size of the coefficient as the level of expertise in the subjects increases. This trend is supportive of the expectation that consistency of accuracy in responses to the items should increase on a test which is validly measuring its intended topic as the amount of training and experience of the subjects tested, relative to the topic, increases. The results of this analysis are reported in Table 3 below in terms of coefficient Alpha (KR-20) for the following groups: 23 of the students enrolled in a basic reading course at a university who took the instruments as a pretest (PRE) and a posttest (POST); 114 teachers and students, except those with reading certification and the pre- posttest group, who otherwise constituted the majority of the sample for the study (OTHER); 144 teachers and students constituting the combined total of subjects in the study, exclusive of the pretest scores (COMB); and 28 teachers who possess certification in reading (CERT).

As in Burnett's (1961) study, the lowest coefficient reported was for the group of pretest students. To validate Burnett's suggestion that this type group was responding in an almost random manner on their pretest, a $t$ test was also performed for both the Tot-K and Tot-P means of this group as compared to the probability mean score that would be expected from random responses.

Table 3

Reliability Coefficients (KR-20) for Groups of Subjects
With Varying Levels of Training

| Subtest | Pre | Post | Other | Comb. | Cert. |
|---------|------|------|-------|-------|-------|
| K-1  | .12  | .40  | .16  | .33  | .68  |
| K-2  | .27  | .58  | -.05 | .01  | .07  |
| K-3  | -.18 | .26  | .46  | .46  | .46  |
| K-4  | .33  | .08  | .14  | .31  | .64  |
| K-5  | .25  | .15  | .21  | .29  | .50  |
| K-6  | .20  | .12  | -.01 | -.06 | -.11 |
| K-7  | -.37 | .44  | .54  | .59  | .74  |
| K-8  | .05  | .60  | .62  | .67  | .80  |
| K-9  | -.10 | -.26 | -.03 | .01  | .01  |
| K-10 | -.28 | -.14 | .21  | .27  | .48  |
| P-1  | -.33 | .54  | .41  | .44  | .56  |
| P-2  | .40  | -.01 | .32  | .33  | .41  |
| P-3  | -.55 | .13  | -.02 | .09  | .38  |
| P-4  | .06  | .45  | .47  | .48  | .42  |
| P-5  | .38  | .67  | .54  | .56  | .56  |
| P-6  | .60  | .64  | .61  | .61  | .62  |
| P-7  | .37  | .04  | .33  | .42  | .56  |
| P-8  | .37  | .69  | .47  | .47  | .46  |
| P-9  | .67  | .47  | .73  | .72  | .57  |
| P-10 | .19  | -.13 | -.02 | .05  | .27  |
| Tot-K | .28  | .56  | .68  | .78  | .90  |
| Tot-P | .63  | .79  | .75  | .78  | .81  |

For the purpose of this type of comparison, a probability score was calculated for each test based on the ratio of one correct response per item to the total number of possible responses per item, with the assumption of item independence underlying this procedure. Since these probability scores were computed theoretically, with no actual data generated, no estimate of the probability variance was available. However, since this procedure requires the assumption of similar variances, the variance of the subjects' actual scores was used as an estimate of the probability score variance in each of the $t$ tests performed in this phase of the study.

As is shown in Table 4, there is no significant difference between the pretest group's mean and the chance mean for Tot-K. This suggests that when knowledge is not present, as in the case of a pretest on a no previous coursework in reading group, that subjects have no better strategy of response than that of guesswork. The change in response strategies after access to knowledge is supported by the results of a $t$ test performed in the manner described above on the group's posttest scores versus the same probability mean. This test yielded a difference statistic that was significant beyond the $p = .001$. These results are summarized in Table 5.

Table 4

Means, Variances, and $t$ Values for Subjects in the Pretest Group and the Probability Score for the Knowledge Domain

| Group | n | Mean | $s^2$ | t | p |
|---|---|---|---|---|---|
| Pretest Tot-K | 23 | 24.52 | 20.17 | .51 | .10 |
| Probability Tot-K | -- | 25.00 | 20.17* | | |

*Variance of Prob-Tot K assumed to be equal to Variance of Pre-Tot K.

Table 5

Means, Variances and t Values for Subjects in the Posttest Group
and the Probability Score for the Knowledge Domain

| Group | n | Mean | $s^2$ | t | p |
|---|---|---|---|---|---|
| Posttest Tot-K | 23 | 57.13 | 84.66 | 16.75 | .001 |
| Probability Tot-K | -- | 25.00 | 84.66* | | |

*Variance of Prob Tot-K assumed to be equal to Variance of Post Tot-K.

Contrary to these findings, there is a significant difference
(p = .001) between the pretest mean and the chance mean on Tot-P.
This suggests that when confronted with problem solving situations,
subjects are likely to employ a repertoire of skills that enhance the
likelihood of a correct response even when their choices have no
specific basis for verification as in the pretest situation. Table 6
reports the means, variances, t value and probability for subjects in
this pretest Tot-P versus probability Tot-P analysis.

Table 6

Means, Variances and t Values for Subjects in the Pretest Group
and the Probability Score for the Performance Domain

| Group | n | Mean | $s^2$ | t | p |
|---|---|---|---|---|---|
| Pretest Tot-P | 23 | 22.39 | 26.34 | 6.36 | .001 |
| Probability Tot-P | -- | 10.75 | 26.34* | | |

*Variance of Prob Tot-P assumed to be equal to Variance of Pre Tot-P.

## Interaction of Training and Experience

The first hypothesis tested by the study sought to investigate the presence of an interaction of the factors of level of training in teaching reading and the years of experience in reading instruction. Both the knowledge and performance domains were checked for this effect, with subjects grouped for analysis purposes into six levels of training and four levels of experience.

The levels used were decided upon by a consideration of sufficient n in each cell created and the need to detect changes in subjects as a result of growth in competence during the early phases of training and experience on the job, the effect of completion of a program of training resulting in certification, and the trend Burnett (1961) reported wherein a drop in teachers' mean scores occurs when experience extends beyond three years.

An analysis of variance of mean scores among the six levels of training and the four levels of experience was conducted to test the hypothesis that the level of knowledge in teaching reading was a function of the interaction of the factors of training and experience. Table 7 reports the results of this analysis which produced an F value for the total knowledge test score (Tot-K) of .51 with $p = .9$. The means and variance for each of the cells in the research design are reported in Table 8 for the variable Tot-K.

The analysis of variance among the six levels of training and the four levels of experience was performed to test the hypothesis that the level of proficiency in performing the generic tasks of teaching reading was a function of the interaction of the factors of training

Table 7

Anova Table for the Variables of Training and Experience and Their
Interaction on the Knowledge Domain Total Scores

| Source | Sum of Squares | d.f. | Mean Square | F | p |
|--------|----------------|------|-------------|------|-----|
| Training | 1027.73 | 5 | 205.55 | 1.44 | .21 |
| Experience | 132.04 | 3 | 44.01 | .31 | .82 |
| Train*Exp. | 794.07 | 11 | 72.19 | .51 | .90 |
| Error | 17232.48 | 118 | 146.04 | | |

Table 8

Means and Variances of Subjects' Scores in the Knowledge Domain for Each of the Levels of Training by Each of the Levels of Experience

| | TRAINING | | | | | |
|---|---|---|---|---|---|---|
| | zero courses | one course | two courses | 3 to 5 courses | 6 to 9+ courses | reading certificate |
| **EXPERIENCE** | | | | | | |
| zero years | $n = 7$ $\overline{X} = 48.43$ $s^2 = 28.95$ | $n = 30$ $\overline{X} = 54.33$ $s^2 = 100.57$ | $n = 22$ $\overline{X} = 50.77$ $s^2 = 50.76$ | $n = 5$ $\overline{X} = 45.40$ $s^2 = 113.3$ | $n = 1$ $\overline{X} = 49.0$ $s^2 = xxx$ | $n = 2$ $\overline{X} = 35.0$ $s^2 = 242$ |
| 1 to 3 years | $n = 2$ $\overline{X} = 52.0$ $s^2 = 72$ | $n = 1$ $\overline{X} = 67$ $s^2 = xxx$ | $n = 3$ $\overline{X} = 52$ $s^2 = 13.00$ | $n = 7$ $\overline{X} = 54$ $s^2 = 29.33$ | $n = 1$ $\overline{X} = 35$ $s^2 = xxx$ | $n = 7$ $\overline{X} = 48$ $s^2 = 270.33$ |
| 4 to 6 years | $n = b_1$ $\overline{X} = a_n$ $s^2 = k_k$ | $n = b_1$ $\overline{X} = a_n$ $s^2 = k_k$ | $n = 1$ $\overline{X} = 52$ $s^2 = xxx$ | $n = 3$ $\overline{X} = 45.33$ $s^2 = 6.33$ | $n = 3$ $\overline{X} = 53$ $s^2 = 252.0$ | $n = 11$ $\overline{X} = 50.55$ $s^2 = 551.67$ |
| 7 to 9+ years | $n = b_1$ $\overline{X} = a_n$ $s^2 = k_k$ | $n = b_1$ $\overline{X} = a_n$ $s^2 = k_k$ | $n = 5$ $\overline{X} = 51.6$ $s^2 = 67.3$ | $n = 13$ $\overline{X} = 51.23$ $s^2 = 93.53$ | $n = 6$ $\overline{X} = 46.67$ $s^2 = 108.27$ | $n = 8$ $\overline{X} = 43.63$ $s^2 = 307.7$ |

and experience. Table 9 reports the results of this analysis which produced an F for the total performance test score (Tot-P) of 1.49 with p = .15. The means and variances for each of the cells in the research design are reported in Table 10 for the variable Tot-P.

Table 9

Anova Table for the Variables of Training and Experience and Their Interaction on the Performance Domain Total Scores

| Source | Sum of Squares | d.f. | Mean Square | F | p |
|--------|----------------|------|-------------|---|---|
| Training | 470.06 | 5 | 94.01 | 2.89 | .02* |
| Experience | 468.58 | 3 | 156.19 | 4.80 | .004* |
| Train*Exper. | 531.42 | 11 | 48.31 | 1.49 | .15 |
| Error | 3781.2 | 118 | 32.04 | | |

/The results reported in Tables 7 and 9 above clearly indicate there is not a significant interaction between the variables of Tot-K or Tot-P. However, there is evidence of a widespread belief within the profession that the interaction of training and experience results in a higher level of competence than does either variable alone./ Such evidence exists in the structure of teacher's salary schedules where step increments provide maximum benefit to those teachers who combine increases in years of experience with additional coursework and/or degrees. The results of this study offer no evidence in support of this belief.

Since, as reported earlier, the strategy for conducting the tests on the hypotheses was to be hierarchial, with the interaction tested first, and since the tests of the interaction were not

Table 10

Means and Variances of Subjects' Scores in the Performance Domain for Each of the Levels of Training by Each of the Levels of Experience

|  | | TRAINING | | | | |
|---|---|---|---|---|---|---|
| EXPERIENCE | zero courses | one course | two courses | 3 to 5 courses | 6 to 9+ courses | reading certificate |
| zero years | $n = 7$ $\bar{X} = 24.86$ $s^2 = 4.81$ | $n = 30$ $\bar{X} = 25.03$ $s^2 = 35.83$ | $n = 22$ $\bar{X} = 25.73$ $s^2 = 20.68$ | $n = 5$ $\bar{X} = 20.8$ $s^2 = 40.7$ | $n = 1$ $\bar{X} = 14$ $s^2 = xxx$ | $n = 2$ $\bar{X} = 13.5$ $s^2 = 12.5$ |
| 1 to 3 years | $n = 2$ $\bar{X} = 21.5$ $s^2 = .5$ | $n = 1$ $\bar{X} = 29$ $s^2 = xxx$ | $n = 3$ $\bar{X} = 30.33$ $s^2 = 6.33$ | $n = 7$ $\bar{X} = 24.86$ $s^2 = 63.14$ | $n = 1$ $\bar{X} = 16$ $s^2 = xxx$ | $n = 7$ $\bar{X} = 30.0$ $s^2 = 13.33$ |
| 4 to 6 years | $n = b$ $\bar{X} = $ a $s^2 = $ n k | $n = b$ $\bar{X} = $ a $s^2 = $ n k | $n = 1$ $\bar{X} = 27$ $s^2 = xxx$ | $n = 3$ $\bar{X} = 22.67$ $s^2 = 41.33$ | $n = 3$ $\bar{X} = 24.33$ $s^2 = 30.33$ | $n = 11$ $\bar{X} = 31.09$ $s^2 = 26.89$ |
| 7 to 9+ years | $n = b$ $\bar{X} = $ a $s^2 = $ n k | $n = b$ $\bar{X} = $ a $s^2 = $ n k | $n = 5$ $\bar{X} = 27$ $s^2 = 59.0$ | $n = 13$ $\bar{X} = 26.69$ $s^2 = 36.06$ | $n = 6$ $\bar{X} = 23.33$ $s^2 = 78.67$ | $n = 8$ $\bar{X} = 29.13$ $s^2 = 30.7$ |

significant, no further analysis was performed on these results, and the interaction term was deleted from the model before a test of the main effects was conducted.

## Main Effects Variables on Knowledge Scores

Subsequent to the results reported above in Table 7, which indicated a lack of significance in either of the variables of training or experience in teaching reading with respect to the explanation of the variances of subjects' knowledge domain scores, an analysis of variance was performed on these variables with the variable of their interaction deleted. This procedure produced an $F = 1.98$ with $p = .09$ for the training variable and an $F = 1.13$ with $p = .34$ for the experience variable. The results of this analysis are reported in Table 11.

Table 11

Anova Table for the Variables of Training and Experience as Main Effects on the Knowledge Domain Total Scores

| Source | Sum of Squares | d.f. | Mean Square | F | p |
|--------|----------------|------|-------------|------|------|
| Training | 1352.29 | 5 | 270.46 | 1.98 | .09 |
| Experience | 465.82 | 3 | 155.27 | 1.13 | .34 |
| Error | 17661.63 | 129 | 136.91 | | |

Table 12 reports the means and variances of subjects' scores on GATER-K at differing levels of training and experience in teaching reading.

Table 12

Means and Variances of Subjects' Total Scores in the Knowledge Domain for Each Level of the Variables of Training and Experience

| Level of Training | n | Mean | $s^2$ |
|---|---|---|---|
| Zero courses | 9 | 49.22 | 33.19 |
| One course | 33* | 54.06 | 118.43 |
| Two courses | 35* | 51.14 | 42.60 |
| 3 to 5 courses | 28 | 50.25 | 76.49 |
| 6 to 9+ courses | 11 | 47.55 | 129.87 |
| Reading Certification | 28 | 46.82 | 372.52 |

| Level of Experience | n | Mean | $s^2$ |
|---|---|---|---|
| Zero years | 67 | 51.22 | 89.41 |
| 1 to 3 years | 21 | 51.24 | 126.89 |
| 4 to 6 years | 18 | 50.16 | 360.74 |
| 7 to 9+ years | 32 | 48.53 | 143.29 |

*Due to missing values in the independent variable "experience," six subjects (2 at the "one course" level and 4 at the "two courses" level) included in these calculations, were dropped from the sample prior to the calculation of the F statistic and the least squares means.

Differences in Knowledge Among Levels of Training

While the interpretability of further statistical analysis on
the training variables as it relates to subjects' scores on the know-
ledge domain test is uncertain, a post hoc analysis comparing the
levels of training was performed. This analysis, using the least
sqaures procedure previously mentioned, utilized the means reported
in Table 13.

Table 13

Least Squares Means for Subjects' Total Knowledge Domain Scores
for Each Level of the Variable Training

| Level of Training | n | Least Squares Mean |
|---|---|---|
| Zero courses | 9 | 51.79 |
| One course | 31 | 58.31 |
| Two courses | 31 | 53.59 |
| 3 to 5 courses | 28 | 50.55 |
| 6 to 9+ courses | 11 | 47.33 |
| Reading Certification | 28 | 45.76 |

Differences were detected at p = .05 between the subjects having
one course in reading and those having three to five courses, six to
nine or more courses, and those having reading certification; and
the subjects having two courses in reading and the reading certifica-
tion group. Other differences among levels were at less than the
p = .05 level. These results are reported in Table 14.

Table 14

Post Hoc Comparisons of Training Levels Via Least Squares
Procedure for Estimating Differences in Total Knowledge Means

| Level of Training | 0 | 1 | 2 | 3 - 5 | 6 - 9 | Cert. |
|---|---|---|---|---|---|---|
| 0 | -- | 6.52 | 1.80 | -1.24 | -4.46 | -6.03 |
| 1 | | -- | -4.72 | -7.76* | -10.98* | -12.54* |
| 2 | | | -- | -3.04 | -6.26 | -7.78* |
| 3 - 5 | | | | -- | -3.22 | -4.78 |
| 6 - 9 | | | | | -- | -1.56 |

*Differences between levels' LS means significant @ p = .05.

The rather small but positive t value associated with the comparison of the difference between the level of zero courses and one course in reading obtained from Table 14 (p = .15) and the correspondingly small F of 1.98 with p = .09 reported in Table 11 warranted further investigation as to the adequacy of these nine subjects at the zero training level in representing the larger population of subjects with no training in the teaching of reading.

Differences in Knowledge Scores Among Selected Levels of Training

The ability of GATER-K to detect significant changes in subjects' mean scores resulting from exposure to instruction in teaching reading has been previously tested and reported in Table 4. However, the deletion of the 23 pretest subjects' scores from the analysis discussed above left only nine subjects in the category of zero courses in teaching reading.

An examination of the population characteristics for this group revealed that all nine of these subjects had some teaching experience, although not in teaching reading. And an examination of the means of the various levels of training and the means of the pretest group suggested that the scores of these nine subjects were more like the scores of other subjects having the benefit of instruction in teaching reading than the scores of the pretest group. This observation suggested conducting a $t$ test to compare the means of the pretest group with that of the zero course level group. This test produced a $t$ of 13.03 with p = .001. Next, a $t$ test was performed to compare the nine zero course level subjects' mean with the 31 subjects with one course in reading instruction. This test produced a $t$ of 1.28 with p = .11. Table 15 summarized the results of these comparisons.

Table 15

Means, Variances and $t$ Values of Total Knowledge Domain Scores for Subjects at the Pretest Level, Zero Course Level, and One Course Level of Training

| Group | n | Mean | $s^2$ | t | p |
|---|---|---|---|---|---|
| Pretest | 23 | 24.52 | 20.17 | 13.03 | .001 |
| Zero courses | 9 | 49.22 | 33.19 | 1.28 | .11 |
| One course | 33 | 54.06 | 118.43 | | |

These tests' results indicate the possibility that the nine subjects representing the level of zero training are not representative of a pre-instructional group and in fact, whether by virtue of teaching experience or some other reason, they are more like subjects who

have received instruction in teaching reading. This finding suggests
the need for further study to clarify the ambiguity in the present
study's results.

## Effect of Experience on Knowledge Scores

As reported earlier, the deletion of the interaction of training
and experience from the analysis of variance of the variable experi-
ence on subjects' total knowledge scores resulted in an $F = 1.13$ with
$p = .34$ (see Table 11). The small F produced and the failure to
achieve the criterion p value of .05 indicate that years of experience
in teaching reading is not by itself a significant variable in explain-
ing the differences in subjects' total knowledge scores as observed
in this study.

This result was not surprising as there has been no suggestion
made that experience alone is sufficient opportunity for subjects to
acquire the specific knowledges measured by GATER-K, as these have
been previously defined as facts, procedures, rules, and generaliz-
ations which must be learned and stored in memory for later use,
and are assumed to be primarily learned via study and instruction.

## Main Effects Variables on Performance Scores

As reported in Table 9 above, the factors of training and
experience in teaching reading as main effects variables in this
design were found to be highly significant in their explanation of
variance among the levels of subjects on the performance domain
test (GATER-P), with the variable training in teaching reading pro-
ducing an $F = 2.89$ with $p = .02$, and the variable experience in teach-
ing reading producing an $F = 4.80$ with $p = .004$. Table 16 reports
the performance test means and variances for subjects at each of the

levels of these variables. A discussion of the differences among the levels of these variable is provided below.

Table 16

Means and Variances of Subjects' Total Scores in the Performance Domain for Each Level of the Variables of Training and Experience

| Level of Training | n | Mean | $s^2$ |
|---|---|---|---|
| Zero courses | 9 | 24.11 | 5.86 |
| One course | 33* | 24.85 | 37.57 |
| Two courses | 35* | 26.31 | 24.81 |
| 3 to 5 courses | 28 | 24.75 | 44.34 |
| 6 to 9+ courses | 11 | 22.09 | 58.09 |
| Reading certification | 28 | 29.00 | 41.19 |

| Level of Experience | n | | |
|---|---|---|---|
| Zero years | 67 | 24.41 | 32.43 |
| 1 to 3 years | 21 | 26.81 | 39.26 |
| 4 to 6 years | 18 | 28.33 | 37.76 |
| 7 to 9+ years | 32 | 26.72 | 44.92 |

*Due to missing values in the independent variable "experience," six subjects (2 at the "one course" level and 4 at the "two courses" level) included in these calculations, were dropped from the sample prior to the calculation of the F statistic and the least squares means.

Performance Differences Among the Levels of Training

Having determined that a significant difference existed among some of the levels of the variable training, a post hoc analysis was performed to determine at which levels these differences were significant at $p = .05$.

The calculation of the least square means for each of the levels of training produced a pattern of change between means that, while generally consistent with the results of Table 16, made the assessment of these differences more accurate relative to the error in the prediction equation. The means used in this least squares procedure are reported in Table 17, while the results of these comparisons are reported in Table 18.

Table 17

Least Squares Means for Subjects' Total Performance Domain Scores for Each Level of the Variable Training

| Level of Training | n | Least Squares Mean |
|---|---|---|
| Zero courses | 9 | 26.86 |
| One course | 31 | 28.65 |
| Two courses | 31 | 28.68 |
| 3 to 5 courses | 28 | 24.50 |
| 6 to 9+ courses | 11 | 21.12 |
| Reading certification | 28 | 28.02 |

Table 18

Post Hoc Comparisons of Training Levels Via Least Squares Procedure
for Estimating Differences in Total Performance Means

| Level of Training | 0 | 1 | 2 | 3 - 5 | 6 - 9+ | Cert. |
|---|---|---|---|---|---|---|
| 0 | --- | 1.78 | 1.82 | 2.36 | -5.73* | 1.16 |
| 1 | | --- | .03 | -4.15* | -7.52* | -.63 |
| 2 | | | --- | -4.18* | -7.55* | -.66 |
| 3 - 5 | | | | --- | -3.37 | 3.52* |
| 6 - 9+ | | | | | --- | 6.90* |

*Differences between levels' LS means significant @ $p = .05$.

While there is an apparent increase in subjects' performance during the beginning levels of coursework in reading instruction, a noticeable drop in performance occurs as subjects increase their preparation outside of a certification yielding program, and a predictable maximum performance is reached by those subjects possessing certification in reading instruction. The post hoc analysis reveals no significant difference ($p = .05$) among the scores of the nine subjects with no training, those with one course, or two courses, and the reading certification group. Likewise, the apparent differences between these four levels of training and the levels of three-to-five courses and six-to-nine-plus courses, which are not significantly different from each other, are significant beyond the $p = .05$ level.

These results produced some findings that warrant further discussion. While it might be expected that a clear and consistent

increase in means would parallel the increases in levels of course-work, and while it is possible that these results simply reflect an unexpected bias in the study sample, two important considerations are offered to explain the results' deviation from this expectation. First, as noted in the previous section, despite the modest gains between the zero course level group and the one course and two course group which are not significantly different, there is reason to suspect that the nine subjects in the zero course group are not representative on a non-instructed and non-experienced group. Secondly, the similarity in scores among the levels of the one course and two course groups and the reading certified groups suggests that as with the knowledge scores, the majority of competence, as measured by GATER-P, is acquired in the earliest stage of instruction and that either little is gained or little is to be gained by additional course-work in reading instruction. However, since the reading certification group is the only group to approach the predetermined and arbitrary competency criteria of 70 percent on GATER-P, it is just as likely that there is more to be learned in subsequent courses of instruction that would serve to enhance these competencies, provided the curriculum in those courses coincides with the competencies herein identified, rather than more generalized or non-competency related matters. Also suggested by these data is the implication that, due to the quantitative strength of their scores, teachers charged with the responsibility of initial instruction in reading be either certified in reading or have received at least two courses in reading instruction that are part of a program sequence leading to reading certification in order to increase the likelihood that their level of competence would be sufficient enough to warrant the expectation of their success.

Finally, the finding that the scores for the groups with three-to-five courses and six-to-nine plus courses are significantly lower than those of all other groups except the zero course group is unexpected but not without several possible explanations. First, is the possibility that mere coursework in reading instruction does not necessarily improve competency in reading instruction, insofar as is measured by GATER-P, unless it is organized and sequenced into some kind of meaningful program of study such as a program leading to reading certification. Of critical importance to this explanation is the lack of content control in such practices, which can easily fall prey to important omissions and/or redundancy in content without providing a cohesive pattern of development. Equally plausible, especially considering the population in this study, and not at all inconsistent with the explanation above, is the distinct likelihood that courses in reading instruction provided via district inservice are quantitatively and qualitatively different, and relative to the competencies assessed herein, inferior to the more formal instruction associated with university-delivered coursework and programs. This latter explanation should be given considerable weight as the author's personal knowledge of the subjects included within the study reveals that the overwhelming majority in the groups under discussion received reading instruction primarily through inservice coursework focusing on reading instruction in the content areas and reading instruction designed to facilitate the implementation of district adopted basal reading series.

Other explanations exist and should be mentioned, although no basis of support can be found for this position within the scope of the present study. The issue of whether the area of reading instruction attracts its fair share of high quality postgraduates into advanced study or whether the more capable students are attracted to and siphoned off by other speciality areas is one of considerable importance. The possibility of the latter, along with the practice of bypassing graduate school entrance requirements by those who seek to add new areas of certification and/or extend existing certification by enrollment in a non-degree yielding status, could also account for the drop in mean scores in levels three-to-five and six-to-nine plus.

## Performance Differences Among the Levels of Experience

In the course of testing the hypothesis that an interaction of training and experience existed to influence scores in the performance domain, the variable of experience was found to be a significant contributor to the explanation of the variance in subjects' performance scores (see Table 9).

Subsequent to this finding a post hoc comparison among the means of the four experience levels was undertaken to determine which levels of experience were significantly different from the others in terms of subjects' scores. As in the procedure described previously involving the training variable, variance in variables attributable to the unequal number of subjects in each of the levels was partialed out of the post hoc comparison tests by use of the least squares procedure. These adjusted means used for the comparisons are reported in Table 19. The differences calculated to exist between these various adjusted means are reported in Table 20.

Table 19

Least Squares Means for Subjects' Total Performance Domain Scores
for Each Level of the Variable Experience

| Level of Experience | n | Least Squares Mean |
|---|---|---|
| Zero years | 67 | 22.69 |
| 1 to 3 years | 21 | 26.58 |
| 4 to 6 years | 13 | 28.32 |
| 7 to 9+ years | 32 | 27.62 |

Table 20

Post Hoc Comparison of Experience Levels Via Least Squares
Procedure for Estimating Differences in Total Performance Means

| Level of Experience | 0 | 1 - 3 | 4 - 6 | 7 - 9+ |
|---|---|---|---|---|
| 0 years | -- | -3.89* | -5.63* | -4.93* |
| 1 - 3 years | | --- | -1.73 | -1.04 |
| 4 - 6 years | | | | .69 |

*Differences between levels' LS means significant @ p = .05.

The results above indicate that performance among subjects at all
levels of experience are significantly distinguishable from the per-
formance of those with no experience in reading instruction. The
indication of the means (Table 16 and 19) that there might be a peak
level of experience relative to the performance variable was not
confirmed by the analysis which found no significant differences among
any of the three levels of experience above the zero experience level.

Thus it seems clear that some actual experience in teaching reading is important to the acquisition of competency in the performance domain. However, while it may be argued that professional competence continues to develop with the experience of the practitioner, no indication exists in these results that this growth is appreciably significant.

Several explanations are possible. Perhaps in the settings in which the subjects acquired their experiences there was a limited opportunity to practice certain of the competencies. In this case, additional experience would serve only to maintain the competencies already acquired, rather than serve to present an expanded opportunity to practice and acquire additional competencies.

Another equally plausible explanation would be that increasing expertise acquired via additional experience is of a nature that is not measured by GATER-P. Since this instrument proposes only to measure ten generic competencies, growth in other areas would rightly not be detected by the instrument.

In either case, no evidence exists in the present data that would support one position over the other. Rather, it is more appropriate to simply reiterate that for the subjects in this study, the evidence indicates the importance of a year or more of experience in achieving competency in the performance domain, but that no significant improvement in competency results from more than one year of experience for the practitioner.

One final note should be made regarding the results reported above. In Burnett's study (1961), he noted a drop in the mean

scores of subjects with more than three years of teaching experience, except those holding master's degrees. The present study also noted a decline in subjects' mean scores, but the present data suggest this drop occurs in subjects with more than seven years of experience. While no direct comparison is advanced regarding these two sets of data, it is worthwhile to mention that the present data confirm this earlier finding that the tendency of the scores to decline after a certain level of experience is not statistically significant.

## Relationship Between Knowledge and Performance

Completion of the foregoing analysis, which indicated that the same variables were not equally significant with respect to their influence upon subjects' scores in both the knowledge and performance domains, left the question of the relationship between subjects' knowledge and performance abilities to be investigated.

To test this relationship, an analysis of variance procedure was conducted using the subjects' total knowledge score (Tot-K) as the independent variable and their total performance score (Tot-P) as the dependent variable. This test produced an $F = 25.32$ with $p = .001$. The results of this analysis are summarized in Table 21.

While these results clearly establish that a relationship exists between the domains of knowledge and performance, the correlation between the two scores on the two tests was .389, which results in a $R^2$ of .15. Therefore, while the level of a subject's knowledge of teaching reading has a significant influence on the level of the subject's performance, as measured by this study, there are obviously other variables which are also influencing this relationship. Since

this study has shown that the tests of training and experience as main effects variables on the knowledge domain scores did not reach the specified level of significance (p = .05), but the tests of these variables did meet or exceed this criteria in relation to the performance scores of subjects in the study, an analysis of variance was performed which combined the variables of knowledge score (Tot-K), training and experience as contributors to the subjects' total performance. The results of this procedure are summarized in Table 22.

Table 21

One Way Analysis of Variance Table for the Total Knowledge Scores as an Independent Variable on the Total Performance Scores

| Source | Sum of Squares | d.f. | Mean Square | F | p |
|--------|---------------|------|-------------|------|-------|
| Total-K | 834.69 | 1 | 834.69 | 25.32 | .0001 |
| Error | 4681.29 | 142 | 32.97 | | |

Table 22

Anova Table Combining the Variables of Training and Experience With the Total Knowledge Scores of Subjects as a Covariate on the Subjects' Total Performance Domain Scores

| Source | Sum of Squares | d.f. | Mean Square | F | P |
|--------|---------------|------|-------------|------|-------|
| Total-K | 765.12 | 1 | 765.12 | 27.17 | .0001 |
| Training | 563.44 | 5 | 112.69 | 4.00 | .002 |
| Experience | 240.51 | 3 | 80.17 | 2.85 | .04 |
| Error | 3605.03 | 128 | 28.16 | | |

The table above establishes the collaborative relationship of all three variables to the subjects' total performance score, but the total $R^2$ for this model is only .30. Therefore, there are obviously other variables not included in this design that hold the potential of providing significant explanation of the variances in scores in the performance domain of teaching reading.

Trends in the Data

While the mean scores of the subjects on both the knowledge and performance domain tests have been previously reported in Tables 8, 10, 12 and 16, a more graphic portrayal of these data are included below along with an analysis of their trends.

Figure 1 presents the results of subjects' mean scores in the knowledge domain over time, which is represented by both years of experience in teaching reading and the number of courses in reading instruction. Two characteristics are observable. First, the majority of knowledge level information about teaching reading (as measured by GATER-K) is acquired in very early phases of professional preparation. Secondly, initial knowledge appears to diminish over time, even when additional courses are taken, certification is attained or experience in teaching reading increases.



Figure 1

| Exper. | 0 | 1-3 | | 4.6 | | 7-9 |
| Training | | 1 | 2 | 3-5 | 6-9 | Cert. |
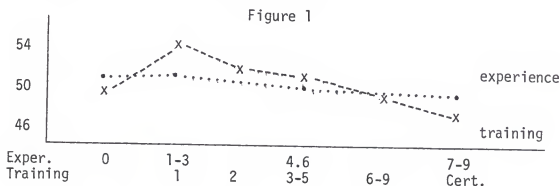
Figure 1. Mean Total Knowledge Scores of Subjects at Varying Levels of Experience and Training

Figure 2 presents the results of subjects' mean scores in the performance domain over time as in Figure 1 above. These data also have two observable characteristics. First, unlike knowledge, maximum performance level is not reached in the initial stages of either variable, but advances gradually through repeated exposures to both coursework and teaching experience. Secondly, this increase does not continue indefinitely, but reaches its maximum level rather quickly, after which it tends to decline. The noticeable exception to this trend occurs among those subjects who have reading certification. This group alone both achieves the highest level of performance and maintains the highest level over time.

Figure 2
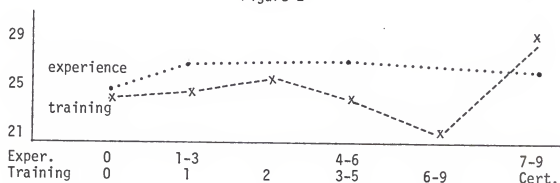


Figure 2. Mean Total Performance Scores of Subjects at Varying Levels of Experience and Training

## Summary

A summary of these findings, some further discussion and recommendations for future research are presented in Chapter V of this study.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

Restatement of the Problem and Hypotheses

The primary purpose of the study was to investigate the influence
of teacher training and experience in teaching reading on the level of
teacher competency in teaching reading. Building upon and extending
the work of previous researchers, the study sought to assess ten
specific competencies in both the knowledge and performance domains
and to investigate the relationship of knowledge as an indicator of
the subjects' overall competency in the performance domain.

Specifically, the study was designed to (a) investigate the
effect of training and experience on teacher competency in teaching
reading in both the knowledge and performance domains, and (b) exam-
ine the relationship of teachers' overall knowledge scores and per-
formance scores on the ten generic competencies assessed.

Hypotheses

In conducting the investigation, three questions were investi-
gated:

1. Is there an interaction effect of level of preparation
   (training) and years of experience in teaching reading
   on subjects' competency scores, as measured by GATER-K and
   GATER-P, in either the knowledge or performance domains?

67

2.  Are there main effects of either training or experience
    in teaching reading on the competency scores of teachers,
    as measured by GATER-K and GATER-P, in either the know-
    ledge or performance domains?

3.  Is the level of teachers' knowledge in teaching reading,
    as measured by GATER-K, related to their level of per-
    formance in teaching reading, as measured by GATER-P?

## Instrumentation

Utilizing a set of generic competency statements developed by
Powell et al. (1977) which identified the content areas and corre-
sponding performance tasks considered essential to the successful
teaching of reading, two instruments were developed to assess 10
of the 15 identified competencies. These competency areas were test-
ing, assessment of potential and performance, the functional reading
levels, skill pattern and profile analysis, the total reading program,
the directed reading lesson, phonic analysis and structural analysis
(separated for testing into two parts), comprehension, and readability.

A performance domain test consisting of 92 items was developed
first. This test consisted of 10 subtest sections, each with its
own directions, that presented a situational context from which the
respondents were to select the necessary information, process this
information against their background of training and/or experience
in reading instruction and arrive at the most appropriate decision
from the answer choices available. Results from two pilot testings
were used to reduce this instrument to a 45 item, reformatted ver-
sion named GATER-P, which is the version used in this study.

The knowledge domain was assessed by a 100-item multiple choice instrument measuring the same 10 competencies as GATER-P. This instrument, named GATER-K, had no preliminary field tests performed and was, therefore, used in its entirety in the study. However, prior to use, this instrument was reviewed by reading experts to certify that the content and format were fair and unambiguous, and that the knowledge measured was representative of the field of reading education and that the designated correct responses were clearly appropriate and correct.

Methodology

Two pilot studies were conducted on the performance domain test to provide preliminary reliability data on the instrument. These studies involved groups of 24 and 33 students enrolled in a basic course of reading instruction taught by the present author during the Winter Terms of 1978 and 1979, respectively. Results of the first study lead to the deletion of two items from the functional reading levels subtest due to poor audio quality in the tape recordings of students reading, which yielded ambiguity in the determination of the correct response. A reliability estimate for the remaining 90 items was calculated to be .94.

Further analysis of these data resulted in a shortened (45 items) version, whose overall reliability results from the second pilot study was .73. The results from this second study lead to some reformatting of the order of the subtests and an electronic enhancement of the tape recording used in the functional reading levels subtest.

The construction of the knowledge domain test followed these pilot studies. Both instruments were then assembled into a booklet and photocopy reproductions were made.

The population included in the present study consisted of a total of 144 students and teachers engaged at the time of the testing in either preservice or inservice education in reading instruction. Data were collected on the subjects' backgrounds for both level of training and experience in teaching reading. Additionally, from within the total population, a group of 23 college students was utilized twice in certain of the reliability analyses to obtain comparisons between scores on a pre- and posttest basis.

Instrument Validity

The data collected in the study indicate that both instruments, GATER-K and GATER-P, appear to provide a valid means of assessing generic competencies in reading instruction in both the knowledge and performance domains, respectively. Both instruments, when administered on a pre- and posttest basis, produced scores whose differences were significant at the $p = .01$ level. Thus, the instruments demonstrated an ability to detect differences in subjects' competency levels and appear to be capable of detecting growth in these levels that can be directly attributable to instruction in teaching reading.

Instrument Reliability

Both GATER-K and GATER-P appear to possess a sufficient reliability and sensitivity to justify confidence in their use in assessing the overall level of generic competencies in teaching reading. Calculation of the overall test reliability produced KR-20 coefficients

of .78 on both instruments for the total study population. Additional calculations involving subjects at differing levels of training and experience indicate that the degree of confidence in the instruments' reliability appears to increase as a function of the level of expertise in the subjects being tested. For the group of subjects possessing the highest degree of competency, those with reading certification, the reliability coefficients for GATER-K and GATER-P were .90 and .81, respectively.

## Results of the Hypotheses

The variables of training and experience in teaching reading do not appear to interact to directly influence the level of teachers' competency in either the knowledge or performance domains of reading instruction. Analysis of variance tests of subjects' scores on both instruments resulted in very small F statistics for the interaction of training and experience. Neither of these statistics met the criteria of $p = .05$ and therefore the interaction term was deleted from further analysis.

Neither of the variables of training or experience in teaching reading appear to have a direct relationship to the overall level of knowledge teachers possess about teaching reading. Analysis of variance tests of subjects' scores in the knowledge domain produced results that failed to meet the criteria of $p = .05$ for either of the variables of training or experience.

However, the variable of training, measured in the number of courses in reading instruction, produced a larger F than did the experience variable. In the interest of research, a post hoc

comparison among the six levels of the training variable was conducted to determine which of the apparent differences were of statistical importance. These results revealed strong and significant ($p = .05$) differences between subjects in the early stages of training (1 or 2 courses); and those subjects with no training, those with more than 2 courses and those with reading certification. However, these differences also reveal a negative relationship between these levels which suggests that the majority of knowledge in the teaching of reading is acquired in the first two courses of instruction.

Findings of this type clearly have implications for curriculum design in reading education preparation programs. While results showing a small fluctuation in scores over the upper levels of training would be expected, in light of the generic and minimal nature of the competencies assessed, the consistent and dramatic drop in scores for these levels raises question as to the long term retention and recall of the knowledges included in the preparation of professionals.

There are, however, some important limitations to this generalization which also have application to the performance domain and will be discussed more fully in the following sections. These limitations not withstanding, further study of the phenomenon reported above is obviously warranted before further conclusions can be offered. It is also recommended that future studies include some data on the relationship between the curricular content of subjects' coursework and the specific knowledges assessed.

In contrast to the results reported above for the knowledge domain, the variable of training, measured in the number of courses in reading instruction, and the variable of experience, measured in the number of years of experience in teaching reading appear to have influence on the overall level of competence teachers possess in performing the 10 generic tasks, measured by GATER-P, all of which are considered to effect pupil progress in learning to read.

Analysis of variance results on these two variables and the subjects' performance domain scores justified the conducting of post hoc comparisons among the means to determine where the apparent differences differed statistically from each other.

For the variable training, the apparent increases in subjects' scores from no training to one course to two courses were found to be insignificant ($p < .05$). The results also showed a drop in scores at level three-to-five courses and six-to-nine-plus courses. Tests revealed that these levels were statistically different from all others. The highest scores were found at the reading certification level. The scores at this level were also different from the three-to-five and six-to-nine level but were not distinguishable statistically from any of the other levels, including those with no-training. Subsequent investigation revealed characteristics of the subjects in the no-training level that raised serious question as to their representations of the general population of people with no training in reading instruction.

Similar consideration of the subjects with more than three courses of instruction, but who did not possess certification in

reading, gave rise to several possible explanations for the dramatic drop in scores recorded for these subjects. Perhaps more is not better, unless this more in terms of coursework is purposeful and planned according to some structure such as a program leading to certification. Or perhaps, since the author is aware that the majority of subjects in the study whose course work level was from three-to-nine or more courses had taken these courses primarily through their district's inservice program, there exists the possibility that there is a difference in the quality of college course delivered versus inservice training delivered instruction. There also exists the possibility that there is a difference in the quality of persons who choose college credit courses rather than inservice courses, as this difference related to their ability to apply their background in reading instruction to the 10 generic tasks studied herein. Also considered as a possiblity, although no specific information currently exists to support the position, is the converse situation regarding the quality of subjects taking more than just a basic course or two in reading education. With the growing competition for persons to meet the job demands of the various professions and the differences in income associated with those professions, it is possible that reading education is not attracting the caliber of students into its advanced levels that it should. Perhaps the best talent is being siphoned off by other programs in education and/or industry. In any case, future research should consider one or more of the possibilities discussed above in an attempt to produce results more enlightening than those presently available.

The results of the analysis of variance procedure on subjects' scores on the performance instrument for the variable of experience revealed that proficiency in performing the tasks of reading instruction does appear to be highly dependent upon the experience one has in performing these tasks. The post hoc comparisons of subjects' scores at each of the four levels of training found all of the levels of training to be superior and statistically different from the subjects with no experience in teaching reading. Therefore, the importance of actual experience in achieving a level of competency in the performance of the professional tasks of reading instruction is substantiated. This finding further supports the desirability of a practicum or internship for preservice professionals in order to establish this degree of competency. However, since competency appears to be acquired within the first three years of experience, future studies should investigate changes in performance over the course of days, weeks or even months in order to determine more precisely the length of experience most subjects would need to achieve the desired level of competency. Such findings could provide much useful information to those charged with the responsibility for designing programs of teacher preparation in reading education which would assist them in structuring and sequencing the number and duration of field experiences and internship activities.

While the analysis of variance procedures clearly substantiated the existence of a relationship between knowledge and performance, these same results also indicated that the assessment of the knowledge domain alone is not sufficient to accurately validate that a subject will be able to perform the tasks of reading instruction.

The level of subjects' knowledge accounts for only 15 percent of the total variance in subjects' total performance scores. This finding, coupled with previous results, lead to a test of the combined variables of knowledge scores, levels of training, and levels of experience on the subjects' total performance scores. While in this model, all three variables were statistically significant ($p = .05$), their combined effect accounted for less than one-third of the total variance in subjects' performance scores. Therefore, there appears to be other unknown, but potentially important variables to be considered as having a sizable influence on the competence of subjects in performing the tasks of reading instruction. With these results in mind, there is clearly a need for further research to isolate those variables. Such findings would have obvious and important implications for the design of curriculum in the field of preservice and inservice reading education.

Conclusions and Recommendations

Based on the experience and results obtained from the present study, several conclusions and recommendations seem warranted.

First, the assessment instruments developed for and utilized herein, GATER-K and GATER-P, offer a potentially valid and reliable means of measuring the level of teacher competence in ten generic areas of reading instruction. These instruments also have the ability to provide data on the level of achievement associated with each of the ten competencies in both the knowledge and performance domains. Further, they have both demonstrated an ability to measure changes in competency resulting from instruction in reading education.

These conclusions warrant a recommendation for the utilization of these instruments in further research in this area. The stability of the reliability of GATER-P in its shortened form supports a similar revision of GATER-K in order to reduce the time needed for administration.

The spiraling curriculum concept that relies upon the reciprocal effects of training and experience to enhance expertise is subject to serious question in the field of reading instruction. While the present author does not question the theoretical foundation of this concept, there is serious doubt as to its practical implications. There appears to be no justification for a belief that classroom instruction and actual experience are combining to improve the competence of reading educators. Rather it seems more likely that current practices in reading education are effective in the early stages of training but have failed to provide an overall program to improve teacher competency in teaching reading that builds upon these initial offerings. The notable exception that reading certified teachers make to this trend supports the recommendation that offerings in reading education be more structured along the lines of certification yielding programs and that this structure once established be enforced to insure a maximum improvement of competency by those seeking to enroll in subsequent levels of training.

Experience in teaching reading obviously contributes to the acquisition of competency in performing the tasks of reading instruction. However, the lack of a continuous, positive increase in the level of both knowledge and performance competence over the range

of experience levels suggests a need for professional review and refreshment of training and on-the-job performance practices. It is further recommended that additional research be conducted which focuses on the longitudinal effects upon competence of time on the job and away from a formalized program of refresher instruction.

Finally, there is a need to investigate variables other than the number of courses taken and the number of years of experience in teaching reading that contribute to the competency of reading professionals. Also in line with this recommendation is a need for further information on the content and methodology of instruction that is associated with reading education. While it is not suggested that knowledge is not important in the acquisition of professional competence, it is recommended that knowledge alone not be given too much emphasis in the course of formal education as these results clearly indicate the limitations of this element in differentiating among the various degrees of competence in teaching reading.

APPENDIX A

GENERIC COMPETENCE AND TABLES OF SPECIFICATIONS

The Florida Department of Education "Project to Improve Education in the Basic Skills, Teacher Competencies and Indicators for Learning, Technical Report No. 3," Powell et al. (1977) specified 15 generic competencies, with both a cognitive and performance dimension. Nine of those competencies were selected for development of assessment items in both domains. (Comptency 10 it was decided had two distinct parts, and each was treated separately.) Thus, there were 10 separate subtests developed out of the statements of Generic Competency objectives that follow.

The Tables of Specifications that follow refer to these 10 competencies and the number of items developed to assess each competency.

Appendix A (continued)

## GENERIC COMPETENCIES ASSESSED BY GATER-K

### KNOWLEDGE DOMAIN

Diagnosis and Prescription:

1. Knows the difference between potential, performance, and placement instruments, and the purpose each type serves.

2. Knows the concepts of reading potential and reading performance. Knows how to compute a reading expectancy level by an acceptable technique.

   Knows acceptable margins of discrepancy between potential and performance.

3. Knows the three functional reading levels: independent, instructional, and frustration.

   Knows what constitutes a significant error or misuse in reading performance.

   Knows what to listen for; what not to listen for; and what to look for.

   Knows a differential criteria by difficulty level by which to make decisions.

4. Recognizes skill patterns or profiles of reading performance as determined by assessment devices.

Organization and Managment

5. Develops a rationale for instructional effort including: learning to read, reading to learn, reading for doing, reading for fun, and corrective/remedial reading.

6. Develops a general framework for teaching a reading lesson.

   --Understands the basic purpose of a reading lesson.
   --Knows the characteristics of an acceptable reading lesson.
   --Knows the purpose of each characteristic and the function that each one serves.

Instruction

10A. Knows and can articulate the basic phonic and structural skills.
10B. Develops a framework for the basic decoding skills (phonic and structural).

Appendix A (continued)

12. Knows the value of purpose setting.

    Knows items of language-based comprehensions.

    Knows specific types of psychological-based comprehension skills.

    Knows value of and techniques for framing good questions.

    Developed a conception of the total comprehension area.

14. Knows and understands the problem of the match between reader competence, content factors, word difficulty factors, and sentence difficulty factors.

Appendix A (continued)

## GENERIC COMPETENCIES ASSESSED BY GATER-P

### PERFORMANCE DOMIAN

Diagnosis and Prescription

1. Administer properly the assessment of tests for diagnosis and prescription.

2. Assess to see if a youngster is making progress commensurate with his/her ability (not necessarily by grade or age).

3. Determine functional reading levels for placement in reading material.

4. Use data from selected instruments in organizing, placing, and instructing students.

Organization and Management

5. Implement a rationale into a total classroom reading program.

6. Conduct a directed reading lesson within an acceptable learning framework.

Instruction

10A. Devise teaching strategies for aiding students to acquire a recognition vocabulary (phonic analysis).

10B. Devise teaching strategies for aiding students to acquire a recognition vocabulary (structural analysis).

12. Monitor comprehension development of students by type of specific comprehension skill and by type of content being used.

14. Evaluate the difficulty level of reading material used.

Appendix A (continued)

## TABLE OF SPECIFICATIONS

### Generic Assessment of Teacher Effectiveness in Reading Knowledge Domain

| Content / Outcomes | Knows Terms | Knows Procedures | Knows Duties | Identifies Proper Uses | Comprehends Principles | Total Number of Items |
|---|---|---|---|---|---|---|
| 1. Testing Instruments for Diagnosis and Prescription | | | | 9 | 1 | 10 |
| 2. Assessment of Potential and Performance | 2 | 4 | 3 | | 1 | 10 |
| 3. Functional Reading Levels | 2 | 4 | 4 | | | 10 |
| 4. Skill Patterns and Profiles | 1 | | 3 | | 6 | 10 |
| 5. Total Reading Program | 1 | 2 | | 4 | 3 | 10 |
| 6. Directed Reading Lesson | | 4 | | 6 | | 10 |
| 7. Phonic Analysis | | | 10 | | | 10 |
| 8. Structural Analysis | | | 4 | | 6 | 10 |
| 9. Comprehension Development | 1 | 2 | | | 7 | 10 |
| 10. Difficulty of Reading Materials | | 3 | | 4 | 3 | 10 |
| Total Number of Items | 7 | 19 | 24 | 23 | 27 | 100 |

Appendix A (continued)

TABLE OF SPECIFICATIONS

Generic Assessment of Teacher Effectiveness in Reading
Performance Domain

| Content / Outcomes | Evaluates Performance * | Evaluates Performance GATER-P | Evaluates Materials * | Evaluates Materials GATER-P | Organizes Data * | Organizes Data GATER-P | Prescribes Activities and/or Materials * | Prescribes Activities and/or Materials GATER-P | Total * | Total GATER-P |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Testing Instruments for Diagnosis and Prescription | 10 | 4 | | | | | | | 10 | 4 |
| 2. Assessment of Potential and Performance | | | | | 5 | 3 | | | 5 | 3 |
| 3. Functional Reading Levels | 10 | 5 | | | | | | | 10 | 5 |
| 4. Skill Patterns and Profiles | | | | | 10 | 5 | | | 10 | 5 |
| 5. Total Reading Program | | | | | | | 7 | 5 | 7 | 5 |
| 6. Directed Reading Lesson | | | | | | | 10 | 5 | 10 | 5 |
| 7. Phonic Analysis Strategies | | | | | | | 10 | 5 | 10 | 5 |

Appendix A (continued)

| Outcomes / Content | Evaluates Performance | | Evaluates Materials | | Organizes Data | | Prescribes Activities and/or Materials | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | * | GATER-P | * | GATER-P | * | GATER-P | * | GATER-P | * | GATER-P |
| 8. Structural Analysis Strategies | | | | | | | 10 | 5 | 10 | 5 |
| 9. Comprehension Development | | | 10 | | | | | | 10 | 5 |
| 10. Difficulty of Reading Material | | | 10 | 3 | · | | | | 10 | 3 |
| | 20 | 9 | 20 | 8 | 15 | 8 | 37 | 20 | 92 | 45 |

*Number of items per subtest reported in Technical Report No. 4 (Powell et al., 1977).

APPENDIX B

GATER-K/P

GENERIC ASSESSMENT OF TEACHER EFFECTIVENESS IN READING

KNOWLEDGE DOMAIN - FORM A
PERFORMANCE DOMAIN - FORM B

(EXPERIMENTAL EDITION)

Jeffrey S. Weathers

William R. Powell

Authors

Appendix B (continued)

GATER-K

GENERIC ASSESSMENT OF TEACHER EFFECTIVENESS IN READING

PART ONE

KNOWLEDGE DOMAIN - FORM A

DIRECTIONS:  The following pages (1-  ) contain items 1-100.  These
items are designed to assess the Knowledge Domain that provides the
foundation of competence in each of the ten areas of teaching read-
ing.

For each of these itmes, choose the answer (A-D) that best completes
each of the numbered statements, and record your choices in the
same numbered space on your answer sheet.

When you complete Part One, proceed immediately to Part Two.

Appendix B (continued)

1. By using the informal reading inventory, the teacher of reading
   can gain further insight into the child's:

   A. word attack skills
   B. level of comprehension
   C. vocabulary
   D. all of the above

2. The minimum margin of discrepance used to determine reading dis-
   ability for the middle grades (3-4) is:

   A. 3 months
   B. 6 months
   C. 9 months
   D. 12 months

3. A child who scores 99% accuracy in word recognition and demon-
   strates 92% comprehension on the initial oral reading of a sixth
   grade reading passage would be classified as operating at the:

   A. capacity level
   B. frustration level
   C. instructional level
   D. independent level

4. A retarded reader shows evidence of greatest retardation if he
   makes most of his word recognition mistakes in:

   A. recognition of syllables
   B. word beginnings
   C. word middles
   D. word endings

5. A total reading program includes developmental, recreational, and
   functional reading components which are intended to be:

   A. distinctive from one another in goals, objectives, and tech-
      niques
   B. distinctive entities, each encompassing different grade levels
   C. overlapping, although each has its own distinctive features
   D. overlapping, although each is designated for use in different
      grade levels

6. Regarding the sequencing of instruction in the Directed Reading
   Lesson, which of the following statements is true:

   A. oral reading should precede silent reading
   B. silent reading should precede oral reading
   C. one child should read orally while others follow silently
   D. silent rereading helps students remember the main ideas

Appendix B (continued)

7. Which of the following best articulates the effect of the phonic principle of "x":

   A. "x" says /z/ in the initial position
   B. "x" says /ks/ in the final position
   C. "x" can say /sz/ in some words
   D. all of the above

8. A reader who realizes that the unfamiliar word "knave" has two silent letters is making use of a:

   A. context clue
   B. phonic clue
   C. semantic clue
   D. structural clue

9. The student is more likely to employ suitable reading techniques when:

   A. he is skilled in the mechanics of reading
   B. the sentence structures are simple
   C. the purpose for reading is clear
   D. the material is within the reader's experience

10. Major differences in difficulty scores over the same passage derived from different readability formulas can be reconciled by acknowledgement that:

    A. formulas are necessary evils at this time
    B. different formulas used different rules
    C. different formulas measure different levels of comprehension
    D. human error is always present in the computations

11. When a child's reading grade on a standardized reading test is compared with his reading grade placement on an informal reading inventory, it will generally be found that:

    A. the two scores are quite similar
    B. the performance on the IRI yields a higher grade placement score
    C. the two scores will be almost identical
    D. the performance on the standardized test results in a higher grade placement score

12. Which of the following may not be used to compute a reading expectancy?

    A. $\dfrac{IQ \times MA}{2}$   B. $\dfrac{2MA + CA}{3}$   C. $IQ \times G.P.$   D. (yrs. in school $\times$ IQ) + 1

Appendix B (continued)

13. A good way to evaluate independent reading is:

    A. to keep a record of the number of pages read
    B. to note the suitability of books read
    C. to occasionally check comprehension of books read
    D. all of the above

14. In general, it is expected that a disabled reader will exhibit
    a patter of reading abilities:

    A. that is common and easily recognizable
    B. that is less variable than that of a normal reader
    C. that is more variable than that of a normal reader
    D. that indicates limitations in knowledge of word parts

15. Each of the following is a goal of the developmental reading pro-
    gram. Which is considered as being the most important:

    A. skill in the mechanics of reading
    B. skill in reading comprehension
    C. enthusiasm for reading
    D. learning to read

16. The main purpose of the skill building step in the Directed Read-
    ing Lesson is:

    A. to introduce new word attack skills
    B. to develop vocabulary
    C. to practice various comprehension abilities
    D. all of the above

17. Which of the following best articulates the effect of the phonic
    principle of "hard and soft c":

    A. "c" can sound like /k/ when followed by o, a, or r
    B. "c" sounds like /s/ when followed by i, e, or y
    C. "c" has no sound of its own
    D. all of the above

18. A reader who decides that the unfamiliar word "frighten" has the
    two syllables "frigh" and "ten" has made us of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

Appendix B (continued)

19. Reading in all of the content subjects is characterized by diffi-
    culties resulting from:

    A. abbreviation and symbolization
    B. vocabulary
    C. lack of continuity
    D. failure to reject irrelevant facts

20. When the average sentence length of two separate passages is vir-
    tually the same, the factor of vocabulary load can be considered
    in determining their relative difficulty by:

    A. the amount of personal referents present
    B. the number of prepositional phrases
    C. the number of polysyllabic words
    D. all of the above

21. A fairly adequate measure of general grade level of reading is
    obtained from:

    A. a listening comprehension test
    B. a group survey test
    C. a group diagnostic test
    D. all of the above

22. Which of the following terms are practically synonymous:

    A. achievement, capacity, placement
    B. achievement, expectancy, placement
    C. ability, performance, placement
    D. capacity, expectancy, potential

23. The reading level at which the individual is thwarted or baffled
    by the vocabulary and/or complexity of the language is labeled
    as:

    A. capacity level
    B. frustration level
    C. instructional level
    D. independent level

24. The following test scores for a fifth grade student, Vocabulary =
    5.3; Comprehension = 4.4; Average reading = 4.8, indicate that:

    A. emphasis should be placed upon word attack skills
    B. emphasis must be placed upon general comprehension
    C. emphasis must be placed on word meanings
    D. emphasis must be placed on building interest

Appendix B (continued)

25. Reading skills such as locating, organizing, and evaluating information can usually be taught best in:

    A. basic reading instruction
    B. a separate class in language
    C. connection with social studies and science
    D. connection with music and art

26. Each of the following is a step in a Directed Reading Lesson; which one is intended to require the greatest amoung of class time:

    A. motivation
    B. purpose setting
    C. skills and drills
    D. transfer

27. Which of the following best articulates the effect of the phonic principle of the schwa sound:

    A. schwa usually occurs in an open syllable
    B. schwa usually occurs in a closed syllable
    C. schwa only occurs in accented syllables
    D. schwa only occurs in unaccented syllables

28. A reader who scrutinizes the position of a "y" in an unfamiliar word before deciding on its sound, is making use of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

29. The reader's ability to correctly infer meaning from the vocabulary and expressions in a selection is largely dependent upon:

    A. author's style of writing
    B. purpose and attitude
    C. previous experience
    D. ability to reason

30. The majority of the readability procedures in use today were developed for use with and have their greatest reliability on:

    A. passages of 50-75 words in length
    B. passages of narrative prose
    C. passages from the content fields
    D. passages of 5000 or more words in length

Appendix B (continued)

31. The Metropolitan Achievement Test - Reading is:

    A. a group diagnostic reading test
    B. a group survey reading test
    C. an individual diagnostic reading test
    D. an individual survey reading test

32. Which of the following terms are practically synonymous:

    A. achievement, placement, potential
    B. ability, achievement, performance
    C. capacity, performance, potential
    D. performance, placement, potential

33. A child who scores 94% accuracy in word recognition and demon-
    strates 83% comprehension on the initial oral reading of a third
    grade reading passage would be classified as operating in the:

    A. capacity level
    B. frustration level
    C. instructional level
    D. independent level

34. The overanalytical reader is one who:

    A. is critical of everything he reads
    B. sounds out each part of every word
    C. relies too much upon context clues
    D. reads too much into the story

35. Over which of the following material would the relationship
    between rate and comprehension be most negatively related:

    A. literature
    B. social studies
    C. newspapers
    D. science

36. The primary focus of the discussion step in a Directed Reading
    Lesson is to:

    A. reread selected parts of the story
    B. exchange views on the meanings of expressions used in the
       story
    C. develop the various specific comprehension skills around
       the story
    D. encourage further reading by students interested in the topic

Appendix B (continued)

37. Which of the following best articulates the effect of the phonic principle of "closed syllable":

    A. the vowel is short
    B. the vowel is long
    C. the vowel is silent
    D. the vowel says schwa

38. A reader who decides that the unfamiliar word "masked" has only one syllable is making use of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

39. The extraction of meaning that was obviously intended, but not stated exemplifies the _ _ _ _ _ _ level of comprehension:

    A. evaluative
    B. inferential
    C. literal
    D. reorganizational

40. The cloze procedure may be used as a means of determining:

    A. phonic knowledge
    B. vocabulary development
    C. readiness level
    D. text suitability

41. The California Test of Mental Maturity is:

    A. a group achievement test
    B. an individual readiness test
    C. a group intelligence test
    D. a silent reading test

42. Which of the following is the primary base line criterion used in judging the existence of reading disability:

    A. mental age
    B. chronological age
    C. social age
    D. achievement test grade score

Appendix B (continued)

43. A child who scores 90% accuracy in word recognition and demon-
strates 50% comprehension on the initial oral reading of a
fourth grade reading passage would be classified as having
reached his:

    A. capacity level
    B. frustration level
    C. instructional level
    D. independent level

44. Which of the following means of appraisal of reading growth is
most influential in improving instruction?

    A. day-to-day appraisals by teachers
    B. annual standardized testing programs
    C. periodic individual conferences
    D. weekly criterion referenced testing

45. Learning to fill out forms and following directions are examples
of skills belonging to which of the following facets of the
reading program:

    A. learning to read
    B. reading to learn
    C. reading for doing
    D. reading for fun

46. In the Directed Reading Lesson strategy, an important first step
following the initial silent reading of a selection is:

    A. noting the vocabulary used in the story
    B. reconstructing the basic plot of the selection
    C. practicing the word analysis strategies required by the story
    D. all of the above

47. Which of the following best articulates the effect of the phonic
principle of "open syllable:"

    A. the vowel is short
    B. the vowel is long
    C. the vowel is silent
    D. the vowel says schwa

48. When a reader decides that the last vowel in the unfamiliar word
"murder" is neither long nor short, the reader is utilizing a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

Appendix B (continued)

49. Comprehension skill in grades K through 2 should be:

    A. introduced through listening activities
    B. taught once a week for 35 minutes
    C. approached via round robin oral reading
    D. all of the above

50. An average sentence length alone of 10.5 for Book and 10.1 for Book B would suggest that Book A is:

    A. harder than Book B
    B. easier than Book B
    C. about the same as Book B
    D. not comparable to Book B

51. The Classroom Reading Inventory is:

    A. a silent reading group test
    B. an individual diagnostic test
    C. a listening comprehension test
    D. a general achievement test

52. In which of the following grades would you expect the correlation coefficients between reading and intelligence to be the highest:

    A. first grade
    B. third grade
    C. sixth grade
    D. very little difference at any of the levels above

53. Which of the following does not constitute a scorable error in a child's oral reading performance:

    A. says "the boy and the girl" when the text read "the boy and girl"
    B. says "back" for "black"
    C. says "new shoe" for "old shoe," then pauses and says "old shoe"
    D. speeds up and slurs the last phrase of the passage unintelligably

54. For a class of 3rd (3.3) graders whose medium mental grade is 2.5, and ability in word recognition is 1.7, their general performance is:

    A. superior
    B. average
    C. below average
    D. not determinable from the data

Appendix B (continued)

55. The best instruction in the skill of locating information will:

    A. make use of the card catalogue
    B. involve a task in which several references must be consulted
    C. require the use of the phone book yellow pages
    D. make liberal use of library aids and facilities

56. The main purpose of oral reading should be to:

    A. provide enjoyment for or give information to an audience
    B. check the comprehension of silent reading
    C. test the pupils' ability to sound out words
    D. develop the ability to read rapidly and fluently

57. Which of the following best completes the following rule:
    "Words are made up of pronunciation units called . . .":

    A. phonemes, which are the sounds of each of the letters
    B. phonemes, which are the sounds of each of the groups of
       letters
    C. syllables, which must contain a vowel or vowel combination
       sound
    D. syllables, which must contain both a vowel and one or more
       consonants

58. The reader who can pronounce the unfamiliar word "retractable"
    by saying the prefix "re," the root "tract," and the suffix
    "able" is utilizing a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

59. Which of the following would be the most important goal of com-
    prehension development:

    A. reading to evaluate
    B. reading to follow directions
    C. reading to recall
    D. reading to summarize

60. Which criteria among the following is generally the most important
    in selecting material for classroom use:

    A. interest maturity
    B. difficulty level
    C. specific type of reading demanded
    D. illustration maturity

Appendix B (continued)

61. Knowledge of the norms on a test tells you:

    A. where the average person in the class should be in reading ability
    B. the range in reading ability to expect in the class
    C. which children in the group are not working up to capacity
    D. none of the above

62. What is the approximate reading expectancy of a student with a chronological and actual grade placement of 5.5, and an intelligence quotient of 110:

    A. 5.7
    B. 6.1
    C. 6.5
    D. 6.7

63. Which of the following does not constitute a significant error in a child's oral reading performance:

    A. refuses to attempt to pronounce the word "requisite"
    B. says "began at noon" when text says "began right at noon"
    C. repeats the first two words of the first sentence of the passage
    D. says "blussful" for "blissful"

64. A class of 5th (5.5) graders whose median mental grade is 5.75, and ability in word recognition is 5.25, their general performance is:

    A. superior
    B. average
    C. below average
    D. not determinable from the data

65. The reading of student selected material, including comics, joke books, world record books, etc., is legitimate as a part of:

    A. the developmental reading program
    B. the recreational reading program
    C. the remedial reading program
    D. none of the above

66. The use of oral reading at sight as a device for instruction in the Directed Reading Lesson is:

    A. highly recommended
    B. justifiable, if used judiciously
    C. frequently the best method
    D. justifiable, rarely, if at all

Appendix B (continued)

67. Which of the following best articulates the effect of the struc-
    tural analysis principle of affixes:

    A. detach affixes before applying a pattern
    B. detach affixes after applying a pattern
    C. detach affixes instead of applying a pattern
    D. detach affixes only if they change the meaning

68. The reader who decides that the unfamiliar word "cain" must
    sound like the familiar word "cane" is making use of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

69. Comprehension ability in reading is actually the ability to:

    A. anticipate outcomes
    B. restructure one's own experiences
    C. recall the content of the printed page
    D. understand the author's words

70. Which of the following readability formulas does not directly
    incorporate the factor of average sentence length for estimating
    the reading difficulty of books fourth grade and up:

    A. McLaughlin Smog
    B. Flesch
    C. Dale-Chall
    D. Harris-Jacobsen

71. Norms on a standardized test:

    A. may be considered goals for achievement
    B. represent mediocre performance
    C. are of little value for comparing individuals within a class
    D. are of the greatest value to test makers because they form
       the basis for developing test reliability

72. What is the approximate reading expectancy of a boy entering
    eighth grade with a Stanford-Binet IQ of 115:

    A. 8.5
    B. 8.7
    C. 8.9
    D. 9.1

Appendix B (continued)

73. According to the classification system of reading levels by Betts, the highest reading level at which the individual can read with full understanding and freedom from mechanical difficulties is his:

    A. capacity level
    B. frustration level
    C. independent level
    D. instructional level

74. A class of 2nd (2.4) graders whose median mental grade is 1.90, and ability in word recognition is 2.1, their general performance is:

    A. superior
    B. average
    C. below average
    D. not determinable from the data

75. Which of the following is a major purpose of the recreational reading program:

    A. to read to learn; obtaining information from many types of material
    B. to develop a positive attitude toward reading, to enjoy and appreciate
    C. to demonstrate the teacher's interest in reading to motivate pupils
    D. to improve decoding and comprehension skills through trade book reading

76. Which of the following best defines the purpose of the Directed Reading Lesson:

    A. to teach stories in basal readers
    B. to present reading as a problem solving activity
    C. to encourage all pupils to think correctly
    D. all of the above

77. Which of the following best articulates the effect of the structural analysis principle of ?le*: (* ?le means any consonant followed by "le")

    A. /?le
    B. ?/le
    C. ?l/e
    D. ?le don't divide

Appendix B (continued)

78. The reader who decides that the unfamiliar word "vagrant" has the two syllables "va" and "grant" is making use of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

79. Comprehension is controlled by:

    A. background of experience
    B. intelligence
    C. purpose for reading
    D. all of the above

80. The best informal assessment a teacher can use in determining the readability of one book over another is by the:

    A. number of hard words
    B. number of prepositional phrases
    C. number of polysyllabic words
    D. number of words in the passage

81. One of the unique advantages of standardized tests is that:

    A. they adequately cover the material taught
    B. they are used nationally
    C. they provide norms
    D. all of the above

82. Which of the following is not a reading disability case:

    A. Mary:  school grade - 3.4; rdg. expectancy - 3.9; rdg. grade - 3.1
    B. John:  school grade - 5.0; rdg. expectancy - 6.7; rdg. grade - 5.5
    C. Joel:  school grade - 7.5; rdg. expectancy - 5.9; rdg. grade - 6.2
    D. Anne:  school grade - 4.6; rdg. expectancy - 3.8; rdg. grade - 3.0

83. Which of the following does not constitute a significant symptom in oral reading behavior:

    A. head movements while reading
    B. twitching of the eye(s) during reading
    C. losing the place while reading
    D. occasional hesitation before certain words

Appendix B (continued)

84. Seventy percent of a sixth grade class is above the mean reading score given in the table of norms for sixth graders:

    A. you may assume that the norms were made on a different sort of group, different in intelligence, socio-economic status, etc.
    B. you may assume that this school has done a good job of teaching reading
    C. you need a description of both the group the test was standardized on and of this group before you can assume anything about the effect of the reading program they received
    D. none of the above

85. The purpose of the remedial reading program is to:

    A. correct reading difficulties before they become serious
    B. motivate reluctant learners to "work hard" to avoid remediation
    C. overcome major reading problems that require special expertise
    D. provide reading instruction for the retarded students in the school

86. The purpose setting step of the Directed Reading Lesson should:

    A. determine the expected outcome of the reading
    B. help students feel better about why they have to read
    C. encourage students to read other related stories
    D. insure that all pupils accept the need to learn to read

87. Which of the following best articulates the effect of the structural analysis principle of "vcv:"

    A. /vcv
    B. v/cv
    C. vc/v
    D. vcv (all one syllable)

88. The reader who decides that the first sound in the unfamiliar word "wrought" is a /r/, is making use of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

Appendix B (continued)

89. Which type of questioning places the greatest demand on the respondent after reading:

    A. matching
    B. multiple choice
    C. cued response
    D. unaided recall

90. For a high school student of 2.0 reading ability, which material would be most suitable:

    A. a second grade basal reader
    B. a reading skills text of approximately second grade level
    C. a fourth grade rewrite of Sherlock Holmes
    D. a fourth grade science book

91. When you desire information concerning a child's reading achievement level, you should use which of the following type test:

    A. standardized survey
    B. standardized oral
    C. individual diagnostic
    D. individual intelligence

92. The following test scores for a fifth grade student indicate: (Capacity - 4.2; Comprehension - 4.2; Vocabulary - 4.9)

    A. reading disability
    B. poor word attack skills
    C. serious retardation in reading
    D. adequate reading performance for his capacity

93. Which of the following does not constitute a significant symptom in oral reading behavior:

    A. holding the book 12 to 14 inches from the face
    B. contorting the face during reading
    C. rubbing the eyes while reading
    D. speaking with a high pitched voice

94. Typically, the disabled reader:

    A. possesses extreme physical deficiencies or sensory deficiencies
    B. is a child with more intellectual ability than reading ability
    C. is a result of emotional disturbance
    D. is below average in general intelligence

Appendix B (continued)

95. Remedial reading is best defined as:

    A. a widely used program of instruction for reading teachers
    B. a part of the regular classroom reading instruction that is
       adapted to the specific difficulties of the students
    C. a method of improving the reading of all those children not
       reading up to their actual grade level
    D. teaching by the specialist, outside the regular classroom,
       for students with significant discrepancies between poten-
       tial and performance

96. An important prereading step in the Directed Reading Lesson is:

    A. building background, interest and motivation
    B. presenting new or different vocabulary
    C. providing guidance and setting a purpose
    D. all of the above

97. Which of the following best articulates the effect of the struc-
    tural analysis principle of "vccv":

    A. v/ccv
    B. vc/cv
    C. vcc/v
    D. vccv (don't divide)

98. The reader who decides that the "y" is the final syllable in the
    unfamiliar words "roxy, levy, and sicky" is making use of a:

    A. context clue
    B. phonic clue
    C. semantic clue
    D. structural clue

99. The recommended strategy for developing higher level comprehension
    skills requires that questioning and discussion:

    A. be built upon a solid factual base of information from the
       story
    B. always begin by answering the purpose setting question
    C. initially establishes the reader(s) emotional reaction to
       the passage
    D. consists exclusively of evaluative level inquiries and
       responses

Appendix B (continued)

100. Which of the following readability formulas is designed
     exclusively for estimating reading difficulty of a book at
     the primary level:

     A. Fry
     B. RIDE
     C. Fog Index
     D. Spache

Appendix B (continued)

G A T E R - P

GENERIC ASSESSMENT OF TEACHER EFFECTIVENESS IN READING

PART TWO

PERFORMANCE DOMAIN - FORM B

DIRECTIONS:  The following pages (19-34) contain items 101-145.  These items are designed to assess the Performance Domain that represents your decision making competence in each of the ten areas of teaching reading.

For each of these areas, read the printed directions at the beginning of each section.  Determine your answer and record your choices in the same numbered space (101-145) on your answer sheet.

When you complete Part Two, you may use any remaining time to check over your answers in Part Two of the test.  <u>Do not go back to Part One</u> after you have begun work on Part Two.

Appendix B (continued)

Objective #5   Implement a rational into a total classroom reading program

Directions:   Below are listed _5_ distinctive types of reading activity. Below these
              are a series of sceneriors, typical of efforts to implement this rationale
              into the classroom.

              Read each of the scenerios carefully. Then determine which of the _5_ types
              of reading activity is being served by each of the scenerios. Label each
              scenerio with the letter of the activity (A-E) you've selected. Each activ-
              ity may be used once, more than once, or not at all.

## Reading Activities

A.  Content:  acquiring academic knowledge/book learning
B.  Recreational:  extensive reading, with seeking and self-selection
C.  Retrieval:  recovering and utilizing information/task completing
D.  Corrective:  balancing of reading patterns
E.  Remedial:  revitalizing specific dysfunctions/deficiency curing

## Scenerios

101.  Mr. W, the reading specialist, agrees to test Merle who is several years below the
      rest of the class in reading and makes provision to work individually with Merle
      during the classes' daily reading time. He also calls a parent conference to dis-
      cuss outside tutoring.

102.  Ms. F provides ten minutes of class time three days per week for students to check
      out and return library books, and she also sets aside the last 30 minutes of the
      day on Tuesdays and Fridays for her students to read. No passes, writing, talking,
      or movement is permitted during these times.

103.  Mr. M prepares a class chart reporting the subtest scores from the last county-wide
      testing. Looking it over he notices that several students who are generally adequate
      to-good readers have one to two skill areas where an obvious weakness is evident.
      Responding to this, Mr. M arranges to group his class for skill work and prepares
      materials that will focus on the areas of weakness for the groups. Those students
      without specific weakness areas are grouped together for more general kinds of
      skills activity.

104.  Mr. G has had his class keep daily records of their work in the areas of vocabulary,
      comprehension, and word-attack-skills activities. He has prepared a progress report
      form to be sent out with the six weeks report cards. He had included in his progress
      report packet, a set of simple directions explaining what information is to go in
      what blanks on the form. He has instructed students to use the directions and the
      records of their work to complete the form. He plans to personally check the
      accuracy of the reports before sending them home.

105.  Ms. H teaches social studies and reading to sixth grade students. She has selected
      two sets of books on Florida History, and grouped students according to their reading
      levels. The students are to read the designated chapters from the book assigned to
      learn about Florida's role in the Civil War. She plans to provide in-class reading
      time and frequent discussions over the next two weeks to prepare students for a unit
      test.

Appendix B (continued)

Objective 6

Conduct a directed reading lesson within an acceptable learning framework.

Directions:   Below are listed five characteristics with accompanying definitions that
are considered to be essential to the successful delivery of a directed
reading lesson.

Below these are excerpts typical of those that are provided in the
teachers' guidebook of many popular basal series.

Read the guidebook excerpts carefully and determine which of the five
elements is most adequately accomplished through this activity. Label
each excerpt with the letter of the element (A-E) you've selected.
Each element may be used once, more than once, or not at all.

Elements

A.   Transfer
B.   Purpose:  providing a reason or reasons for reading the selection
C.   Establishing background information:  relating pupils' experiences and concepts
to ideas which are presented in the story
D.   Skills and drills:  extending skills in word attack, sight vocabulary, compre-
hension and vocabulary
E.   Vocabulary introduction:  presenting meaning and pronunciation for words in
the story which children are meeting for the first time(s) in print

Guidebook Suggestions

106.   Invite pupils to share with the class some of their experiences with shadows
and dreams of creatures that they use to think lurked in their bedroom. Ask
if they tended to see these all of the time or just at certain times?

107.   Write the words "giraffe," "lurked," "elusive," "drowsy," and "woozy" on the
chalkboard or overhead in the context of sentences or phrases. Select students
to read these aloud. Ask for context definitions and to use the words in a
sentence.

108.   Instruct students to read this story for fun and pleasure and to find out if
the boys capture this elusive animal.

109.   With the use of the words drowsy, drowsier, drowsiest and woozy, discuss with
pupils the effect upon a final "y" when inflectional suffixes are added. Have
students suggest words that they know which would change a final "y" to "i"
before adding the suffix.

110.   After practicing figurative language terms, have the students create a written
list of figurative expressions to describe common household articles.

Appendix B (continued)

Objective 12

    Monitor comprehension development of students by type of specific comprehension skill and by type of content being used.

Directions:  The following scenerio is to be considered a typical reading exercise consisting of a statement of purpose for reading the story, the passage to be read, and five comprehension questions that might be asked about the story.

           Read the purpose setting statement, the passage itself and the comprehension questions which follow and then decide which type of information the question is designed to elicit. Mark "A" for literal; "B" for implied; "C" for vocabulary; "D" for evaluative; and "E" for the purpose setting question.

           The comprehension questions are of the following four types:

        A.  <u>Literal</u>:     question asks information which is provided directly in the passage.

        B.  <u>Implied</u>:    question asks for information which is not provided directly but is strongly suggested by the structure and wording in the passage.

        C.  <u>Vocabulary</u>:  question requires knowledge of the meaning(s) of a word used in the passage which can be considered to be a new, specialized or infrequent word in the reading vocabulary for that level.

        D.  <u>Evaluative</u>:  question requires that the reader interact with information either provided or implied in the passage and provide a personal decision regarding the meaning, logic, credibility or emotional impact of the passage as it applied to them.

Purpose:  Read to find out why Martians and Earthlings would have a hard time being friends.

Appendix B (continued)

Objective 12 (continued)

Passage:

One strange and restless night, Kim Anderson began a walk that would take her away from the security of her house and into an unknown world of creatures much different from any of her friends.

Kim arose from her bed and wandered through the darkness to a shadowy space lighted by the glow of a Martian flying saucer. Tripping over her own feet, and falling solidly to the earth, Kim awoke.

Somehwat confused, she was fascinated by the sight of the craft and advancing closer she decided to go aboard.

Armaness, a Martian, greeted her with information that she was being taken away for study on his planet. There they hoped to find out whether his people and Earthlings could be friends. Within moments the saucer was airborne.

The experiment began immediately. Kim was asked to fix lunch for Armaness and three friends. She discovered some quite appealing "umbo ice curds," much like her own favorite peach sherbet. To each of the four Martians seated at the table she served a glass of "swom," red like tomatoes and eaten with a straw. As she served Armaness, the glass slipped and flew straight into his lap and the bowl of "umbo" plopped onto his head.

After cleaning up she proceeded to cook a bowl of "sanzellarder." No instructions were provided, so a safe choice should be to bake it, like most earthly casseroles. She slid it into a nearby microwave oven. Unfortunately the Martian microwave made an Earthling's seem like an old woodburner.

The "sanzellarder" cooked too rapidly, burned brightly for a moment, and disintegrated under a puff of blue smoke, leaving a small pile of broken glass.

Armaness was obviously upset. Tonight he would be hungry.

Realizing that friendship was unlikely, Armaness immediately turned the saucer around. Dipping low over the rooftops and slowing only slightly, they dumped Kim out.

A little bruised and definitely tired, Kim watched the ship disappear. "I never really liked green anyway," she shouted.

Appendix B (continued)

Objective 12 (continued)

Questions:

111. Kim was caputred by a creature named?

    a. Umbo                          c. Martian
    b. Armaness                   d. Earthling

112. "Airborne" (paragraph 4) means?

    a. had a baby in the air        c. needed air to live
    b. carried air around          d. took off into the air

113. When Kim watched the saucer fly away she felt?

    a. disappointed             c. silly
    b. afraid                    d. relieved

114. At dinner Kim spilled _____ on Armaness?

    a. peach sherbet           c. "sanzellarder"
    b. "swom"                d. two of the above

115. The "swom" that Kim served was probably a?

    a. meat                  c. vegetable
    b. fruit                d. drink

Appendix B (continued)

Objective 1

Administer properly the assessment tests for diagnosis and prescription.

Directions:  The following is a typical set of general and specific directions
             for administering a standardized reading achievement test.  They are
             to be read, and used for references, in formulating your responses
             to the following set of hypothetical testing situations.

## **IMPORTANT NOTE**

In order to insure the validity of testing results, all pupils must be
tested under the same conditions with respect to the directions in this
manual.  The test administrator should therefore provide himself with
time for thorough study of the tests and the test procedures prior to
administration.

## Test Scheduling

1.  The following schedule of sittings is only suggested, but no more than two
    sittings per day is recommended and the tests must be completed within one
    week's time.

2.  Tests whose adequate completion time is questionable should not be started.

3.  Tests time limits must be adhered to exactly, except that time may be
    called if ALL pupils complete the test before the time limit expires.

## Before Testing

1.  Provide a door sign to prohibit interruptions.

2.  Seat pupils where they cannot copy from each other.  Unsatisfactory
    first seating arrangements may be modified for later sittings.

3.  Remove all non-testing material from pupil's desks.

Appendix B (continued)

Objective 1 (continued)

4. Cover and/or remove all wall materials that may aid students on the tests.

## During Administration

1. Read all directions to students <u>verbatim</u>, but in a natural manner and atmosphere.

2. Directions may be discussed and explained before testing begins.

3. Sample items may be discussed and explained, but additional examples should not be provided.

4. Unless a disturbance interferes with a pupil's hearing, all teacher dictated items are to be read only once.

5. Once a test is underway, the teacher may unobtrusively clarify instructions individually, but no specific item help should be given.

6. Testing time limits should only be given out if students request them.

Using the directions printed above and your knowledge of appropriate test administration practices select one of the four answer choices given below that most accurately characterizes each of the following ten testing situations.

A. Correct according to general and specific directions for test administration.

B. An acceptable decision that should not affect validity.

C. An unfortunate situation with undeterminable effect on validity.

D. An apparent violation of the general and/or specific directions for the test administration.

Appendix B (continued)

Objective 1 (continued)

116. While leafing through a copy of the test his class is busy taking, Mr. Z notes a vocabulary word in one of the reading passages that Johnny missed studying the day he was absent. Wanting to be fair to Johnny, Mr. Z calls Johnny to his desk and pointing out the word, whispers to him the definition.

117. Standing before the class, Mr. L is startled as, from behind him, a high pitched squeal cuts through his pronounciation of the fourth word of the oral vocabulary test he is dictating. Mary timidly requests that he repeat the last word called as she could not hear it clearly. Hesitating a moment, Mr. L observes no further requests and proceeds to the rear of the classroom where he softly repeats the word for Mary.

118. With this being her first standardized test administration, Ms. T was careful to prepare ahead of time. She had her "Do Not Disturb" sign out, had the desks well spaced and had the children remove their books from the desks. As the test got under way, she was walking around the room when she noticed the vowel chart still hanging on the wall behind her desk. Hoping not to be noticed, she continued her movement until her rounds took her back to the front of the room. Reaching up she pulled loose the thumb tacks, lowered the poster and set it on the floor, face backward, against the wall.

119. Having given standardized tests for many years, Mr. R made certain that he took home his directions booklet the night before the tests. He planned to review the directions the next morning as was his usual habit of arising early to do his planning. An unexpected power failure during the night caused his alarm to ring 45 minutes later than usual. Realizing this he quickly dressed, ate and left for school, figuring that he would skip coffee that morning and spend those five minutes on reviewing the page just as the first period tardy bell rang. He passed out the materials and except for a few confusing moments, was able to complete over half of the five test sittings this first day.

Objective 2

For the questions below, use the results of the standardized test scores on the following page to determine the status of each of the children's reading achievement relative to (within the acceptable limits of) their ability:

    a. below acceptable limits for potential (disability)
    b. within acceptable limits for potential (developmental)
    c. above acceptable limits for potential (overachiever)
    d. NOT determinable from available data

120. Joan's performance is _____.

121. Michael's performance is _____.

122. Jerri's performance is _____.

Appendix B (continued)

Objective #2

Assess to see if a youngster is making progress commensurate with his or her ability. (Not necessarily by grade or age.)

Directions: The following information was obtained during the first week Joan, Michael, Jerri, and Albert were in the 5th grade. Carefully consider and utilize the following data to answer the questions on the preceeding page.

Oral Informal Reading Inventory Results

| Name | C.A. | I.Q. | M.A. | R.G. | $1^2$ | 2 | 3 | 4 | 5 | 6 |
|------|------|------|------|------|------|---|---|---|---|---|
| Joan | 10-8 | 83 | 8.9 | 4.2 | 1/35 100% | 1/30 80% | 1/20 70% | 1/10 65% | 1/7 50% | 1/5 50% |
| Michael | 10-0 | 120 | 12-0 | 4.5 | | 1/70 90% | 1/70 80% | 1/30 65% | 1/20 50% | 1/7 45% |
| Albert | 10-2 | 100 | 10-2 | 4.8 | | 1/70 95% | 1/50 90% | 1/20 80% | 1/15 75% | 1/9 60% |
| Jerri | 10-3 | 127 | 13-0 | 5.2 | | | 1/55 80% | 1/55 90% | 1/25 80% | 1/10 75% |

Notes: 1/35, 100% (Joan) is the notation for an average of 1 error for every 35 running words at the indicated reading level while achieving 100% comprehension.

$1^2$ = first reader, 2 = second reader, 3 = third reader, etc.

R.G. is the notation for Reading Grade Placement on a standardized reading test.

Appendix B (continued)

Objective #14    Evaluate the difficulty level of reading material used.

Directions:   Below are printed 3 pairs of narrative passages at varying levels of
              reading difficulty.

              In your capacity as a reading teacher you are to evaluate the relative
              difficulty of these materials and recommend the material of lesser diffi-
              culty. If both selections of any given pair appear to be of approximately
              equal difficulty, you should make no recommendation and let the student's
              choice prevail.

              For each of the following pairs, mark the letter (A or B) of the <u>easier</u>
              passage. If both are approximately the same, mark a "C." If you cannot
              decide, mark "D."

123. (a)   Kim had been observing the stars through his telescope for quite awhile. He
           had seen the usual stars but was disappointed his telescope couldn't reach fur-
           ther into the galaxy. Suddenly, he became aware of a sight he hadn't seen before.
           Kim glanced away then refocused his telescope. The light was still there, mov-
           ing at a regular pace through the sky. Would he dare leave his telescope to
           tell someone about the strange object. (73 wds.)

     (b)   It was Brad's turn to deliver his speech for his class. His report was to
           analyze the town's efforts at improving the environment. Brad had researched
           the local newspaper, talked with local engineers and had formulated a checklist
           of ways to improve the environment. He still wasn't sure if all his efforts
           had produced an outstanding speech. Very hesitantly Brad made his way to the
           front of the room. Slowly he started his speech. (72 wds.)

124. (a)   The boy scouts were having a great time at their annual swimming party at the
           Rainbow River. Bill had been swimming for about an hour and needed some rest.
           Suddenly, he heard a boy yelling who was having trouble getting to the shore.
           As Bill swam to the boy, he called to the other scouts for help. (57 wds.)

     (b)   The boat floated gently in the stream. A mother duck with her baby ducks bobbed
           in the water hunting for bugs. It was a perfect day for a picnic lunch and
           some fishing. Tommy and Matt had not caught any fish, but no one seemed to
           care. They enjoyed the quiet ride in the small boat. (56 wds.)

125. (a)   What a bumpy sidewalk! John had never noticed how uneven it was until today.
           Standing, or rather wobbling, in his new roller skates, he looked at the
           cracks and leaves on the sidewalk with a renewed interest. He saw himself
           racing down the street fast as the wind. But he was a long way from that
           image. (57 wds.)

     (b)   The newspaper ad had read, "Six week old puppies for sale. Cheap. Come
           by 26 Maple between 2 and 5 p.m." It would be a perfect gift for Tim's
           birthday. But now having arrived, the puppies had all been sold. Tim
           was going to be very sad. He had his mind made up. All he wanted for
           his birthday was a puppy. (64 wds.)

Appendix B (continued)

Objective 10A

    Devise teaching strategies for aiding students to acquire a recognition
vocabulary (phonic analysis).

Directions:  For this part of the test, you are to assume the situation of listening
to a student attempt to pronounce the nonsense words listed below. The
actual pronunciations produced by the student follow the word and are
enclosed in //'s. You are to select from the choices given, the generali-
zation that is correctly stated, applicable to the error and would be of
benefit to the student in preventing these types of mispronunciations in
the future. If the pronunciation is correct, select choice "e."

126.  zleck:  (pronounced as /zlēk/). Generalization:

    a.  an exceptional situation where e followed by c is always short.
    b.  a single vowel in an open syllable is usually short.
    c.  a single vowel followed by a consonant is usually short.
    d.  a single e in a closed syllable is pronouned as "schwa."
    e.  the word was correctly pronounced.

127.  ible:  pronounced /i·bl / ). Generalization:

    a.  a vowel followed by final e is usually long, while the e is silent.
    b.  vowel-consonant-le is a phonogram where e is a schwa and precedes the l in
pronunciation.
    c.  a single vowel followed by a consonant-le is usually short.
    d.  the pattern vowel-consonant-le is all pronounced as a single blend.
    e.  the word was correctly pronounced.

128.  ceze:  (pronounced /sē.z /). Generalization:

    a.  when a word has two vowels, and one is a final e; the first is usually long,
the e is silent.
    b.  a vowel in an open syllable is usually long.
    c.  a final e can be silent or "schwa."
    d.  when e precedes and follows z; the first e is long, second e is silent.
    e.  the word is correctly pronounced.

129.  torist:  (pronounced /tō·rist/). Generalization:

    a.  o followed by r is pronounced as "long o."
    b.  o followed by r is pronounced as "short o."
    c.  o followed by r is neither long, nor short; it is "r-controlled."
    d.  o followed by r is neither long, nor short; it is "schwa."
    e.  the word is correctly pronounced.

130.  rukker:  (pronounced /ruk·ker/). Generalization:

    a.  u produces a short sound when followed by an er.
    b.  u and e in closed syllables produce short vowel sounds.
    c.  u and e produced the same sound.
    d.  e followed by an r is "r-controlled."
    e.  the word is correctly pronounced.

Appendix B (continued)

Objective 4

Use data from selected instruments in organizing, placing, and instructing students.

Study the data reported for the 6 students featured below, and utilize it to answer the next 5 questions.

Note: All students are of normal intelligence, in the sixth grade, and come from educationally adequate environments. Data reported are in grade equivalents.

| | Aud. Vocab | Phonetic Analysis | | Structural Analysis | | STAR Comprehension Reading Test Comprehension (Power Timed) | | | Comprehension Untimed Diagnostic | | Rate | Study Skills |
| | | Vowels | Consonants | Word Division | Blending | Literal | Inferential | Total | Sentence | Paragraph | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| John | 3.2 | 2.0 | 3.6 | 2.0 | 3.0 | 3.5 | 2.5 | 2.0 | 3.7 | 2.7 | 1.8 | 2.0 |
| Mike | 5.8 | 6.2 | 7.0 | 6.5 | 6.8 | 4.7 | 4.1 | 4.4 | 4.6 | 4.2 | 4.0 | 5.2 |
| Mary | 6.0 | 5.7 | 5.9 | 6.0 | 5.8 | 5.2 | 5.4 | 5.3 | 5.0 | 5.1 | 5.1 | 3.5 |
| Ricky | 5.3 | 3.7 | 4.5 | 4.3 | 4.4 | 4.9 | 5.9 | 5.4 | 5.3 | 6.0 | 6.4 | 5.3 |
| Beth | 5.5 | 5.0 | 5.8 | 4.7 | 4.8 | 5.3 | 4.3 | 4.8 | 5.4 | 5.7 | 3.2 | 5.0 |
| Jane | 6.1 | 5.6 | 6.0 | 5.9 | 5.7 | 5.5 | 5.9 | 5.7 | 5.6 | 5.9 | 5.7 | 5.8 |

Appendix B (continued)

Objective 4 (continued)

Directions: Utilizing the data above, select the answer that best reflects your decisions for organizing, placing and instructing students.

131. For the purpose of graded vocabulary development activities, the best grouping would be:

   a. 1 - Mary, Jane         2 - Beth, Mike       3 - John, Ricky
   b. 1 - Mike, Mary, Jane   2 - Beth, Ricky      3 - John
   c. 1 - Mike, Ricky, Beth  2 - Mary, Jane       3 - John
   d. 1 - Mary, Jane, Mike   2 - John, Ricky, Beth 3 - None

132. For the purpose of skill development and practice in phonics, the two students whose profiles indicate the need for individualized instruction are:

   a. Ricky, Mike
   b. Beth, Mary
   c. Ricky, John
   d. Jane, Mary

133. Of all the students profiled above, the student who should not be grouped with Mike for study skills work is:

   a. Beth
   b. Mary
   c. Jane
   d. Ricky

134. The student above whose profile most strongly suggests a reading disability is:

   a. Ricky
   b. Beth
   c. Mike
   d. Mary

135. The student above whose profile is most typically that of a developmental youngster is:

   a. Jane
   b. Beth
   c. Mary
   d. Mike

Appendix B (continued)

Objective 10-B

Directions:  The following 5 items focus on the principles of syllabication. Each
item presents a nonsense word whose letter patterns resemble real
English words. Assume you are instructing a child. For each of the
items select the strategy most appropriate for use in successfully
decoding the word.

136. leffing

A. Should recognize (vccv) and divide between consonants.
B. Should recognize phonogram ing and detach it.
C. Should recognize ff as blend and divide before them.
D. Should recongize "silent vowel" and not attempt division.

137. disibbear

A. Should recognize (vcv) and (vccv) and divide after i and between b's.
B. Should recognize prefix and (vccv) and detach prefix, then split con-
sonants.
C. Should recognize (vcv) and treat bb as one sound; divide after first
vowels.
D. Should recognize prefix and suffix on word; detach both leaving base
word.

138. maffler

A. Should recognize ff blend, apply (vccv) and divide after f's.
B. Should recognize fl blend, apply (vccv) and divide between f's.
C. Should recognize ffl blend, apply (vcv) and divide after a.
D. Should recognize le ending and divide between f's.

139. undergeight

A. Should recognize compound, detach it and apply (vccv) to word.
B. Should recognize (vccv), (vccv), and (vcv) respectively; divide after
n, r, and i.
C. Should recognize (vccv), "silent e" and igh phonogram; divide after n
and before i.
D. Should recognize prefix and detach, apply (vccv), then apply (vcv).

140. raxes

A. Should recognize (vcv) and divide after a.
B. Should recognize ax as phonogram, dividing after the x.
C. Should recognize that x attaches to the preceding vowel to end a syllable.
D. Should recognize x produces two sounds and should be split in half.

Appendix B (continued)

Objective 3

Determine functional reading levels for placement in reading material.

Directions: During this activity you will hear students reading the passages printed below. While listening to each student read the passage, you are to decide whether the material in that passage is too easy, too hard, or appropriate for instructional use with that student.

Mark answer choice "A" if the material is <u>too easy</u>. Mark answer choice "B" if the material is <u>too hard</u>. Mark "C" if the material is <u>appropriate</u> for instruction. Mark "D" if you cannot make a determination.

Ron (reading 5th grade level material)

John had been given two weeks to do an assignment on a modern day hero. He told his parents he had plenty of time to do the paper and would start it the next day. Now the paper was due tomorrow and he hadn't started it. His parents refused to take him to the library so late in the evening. John had gotten himself in a bind. He wondered where the two weeks had disappeared. (73 words)

141. Ron

A. too easy
B. too hard
C. appropriate
D. can't decide

Jack (reading 4th grade level material)

All the neighborhood had their house lights on. First the children were going to have a parade. Then the boys and girls would be walking from house to house to get their treats. They would have to shout "Trick or Treat" first. It was going to be the best Halloween ever. (61 words)

142. Jack

A. too easy
B. too hard
C. appropriate
D. can't decide

Appendix B (continued)

Objective 3 (continued)

Culver (reading 6th grade level material)

     The divers had been working for months now.  Their maps were up to date but they felt frustrated by their attempts to find any evidence of the lost island. Maybe the submerged island was just a fantasy after all.  When they started their search, it seemed so real.  Now it became more a myth than ever.  (56 words)

143.  Culver

    A.  too easy
    B.  too hard
    C.  appropriate
    D.  can't decide

Shelly (reading 5th grade level material)

     The tornado struck quite unexpectantly.  Most people were awakened by the sound of the howling wind.  Suddenly the wind became so fierce that windows and roofs were shattered by the uprooted trees.  After the tornado had passed and the shock had subsided, the citizens could attend to the task of cleaning up from the storm. (55 words)

144.  Shelly

    A.  too easy
    B.  too hard
    C.  appropriate
    D.  can't decide

Jason (reading 4th grade level material)

     The clipper ship was speeding in the ocean.  The captain had a large and expensive cargo to get to France.  He was afraid of pirate ships overtaking him and stealing the precious cargo.  Then on the horizon, against the bright sun, the captain saw the outline of another ship.  Hastily he ordered his men to prepare themselves for battle.  (59 words)

145.  Jason

    A.  too easy
    B.  too hard
    C.  appropriate
    D.  can't decide

## APPENDIX C

## DATA ON THE INSTRUMENTATION

PILOT STUDY I                                    n = 24

    1.  Summary Statistics for Test
    2.  Frequency Distribution of Scores
    3.  Item Response Analysis

PILOT STUDY II                                   n = 33

    1.  Summary Statistics for Test
    2.  Frequency Distribution of Scores
    3.  Item Response Analysis

GATER-K RESULTS                                  n = 168

    1.  Summary Statistics for Test
    2.  Frequency Distribution of Scores
    3.  Item Response Analysis

GATER-P RESULTS                                  n = 168

    1.  Summary Statistics for Test
    2.  Frequency Distribution of Scores
    3.  Item Response Analysis

GATER-K AND GATER-P SUBTEST RESULTS              n = 144

    1.  Subtests Summary Statistics
    2.  Subtests Intercorrelation Matrix

Appendix C (continued)

## PILOT STUDY I

| | | |
|---|---|---|
| Number of Students Taking Test | | 24.00 |
| Total Number of Items on Exam | | 92.00 |
| Range of Scores --- High = | | 51.00 |
| --- Low = | | 13.00 |
| Highest Possible Score | | 87.00 |
| Mean (Average) Raw Score | | 29.25 |
| Median (Middle) Raw Score | | 28.50 |
| Mode (Most Frequent) Raw Score | | 29.00 |
| Standard Deviation (Raw Score) | | 8.69 |
| Standard Error of Measurement | | 3.35 |
| Kuder-Richardson 20 Correlation | | 0.85 |
| Number Used for Disc Index | | 6.00 |

### Frequency Distribution of Scores

| Raw Score | Percent Score | Fre- quency | Z Score | Percentile Rank | Numerical Rank |
|---|---|---|---|---|---|
| 13 | 14.94 | 1 | -1.87 | 2.08 | 24 |
| 18 | 20.69 | 1 | -1.29 | 6.25 | 23 |
| 20 | 22.99 | 2 | -1.06 | 12.50 | 21 |
| 23 | 26.44 | 1 | -0.72 | 18.75 | 20 |
| 25 | 28.74 | 2 | -0.49 | 25.00 | 18 |
| 26 | 29.89 | 1 | -0.37 | 31.25 | 17 |
| 27 | 31.03 | 2 | -0.26 | 37.50 | 15 |
| 28 | 32.18 | 2 | -0.14 | 45.83 | 13 |
| 29 | 33.33 | 3 | -0.03 | 56.25 | 10 |
| 30 | 34.48 | 2 | 0.09 | 66.67 | 8 |
| 31 | 35.63 | 1 | 0.20 | 72.92 | 7 |
| 33 | 37.93 | 1 | 0.43 | 77.08 | 6 |
| 34 | 39.08 | 1 | 0.55 | 81.25 | 5 |
| 35 | 40.23 | 1 | 0.66 | 85.42 | 4 |
| 45 | 51.72 | 1 | 1.81 | 89.58 | 3 |
| 46 | 52.87 | 1 | 1.93 | 93.75 | 2 |
| 51 | 58.62 | 1 | 2.50 | 97.92 | 1 |

Appendix C (continued)

ITEM ANALYSIS PAGE 1 -- Item Response Figures Are Totals, Not Percentages

| Item Number | - Item Responses - | | | | | | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Other | | | |
| 1 | 0 | 1 | 3 | 20+ | 0 | 0 | 0.83 | 0.00 | 0.22 |
| 2 | 3 | 4 | 7 | 10+ | 0 | 0 | 0.42 | -0.50 | -0.33 |
| 3 | 0 | 0+ | 2 | 22 | 0 | 0 | 0.00 | 0.00 | 0.00 |
| 4 | 12+ | 12+ | 0 | 0+ | 0 | 0 | 0.00 | 0.00 | 0.00 |
| 5 | 14+ | 7 | 1 | 2 | 0 | 0 | 0.58 | 0.00 | -0.11 |
| 6 | 2 | 3+ | 19 | 0 | 0 | 0 | 0.13 | 0.00 | 0.09 |
| 7 | 8 | 4+ | 1 | 11 | 0 | 1 | 0.17 | 0.17 | 0.05 |
| 8 | 0+ | 6 | 13 | 4 | 0 | 1 | 0.00 | 0.00 | 0.00 |
| 9 | 2 | 2 | 4+ | 16+ | 0 | 0 | 0.17 | 0.67 | 0.62 |
| 10 | 6 | 14 | 2 | 1+ | 0 | 1 | 0.04 | 0.17 | 0.14 |
| 11 | 16 | 6+ | 0 | 0 | 0 | 2 | 0.25 | 0.50 | 0.20 |
| 12 | 3+ | 19 | 1 | 0 | 0 | 1 | 0.13 | 0.33 | 0.35 |
| 13 | 6 | 8+ | 9 | 0 | 0 | 1 | 0.33 | 0.50 | 0.25 |
| 14 | 3+ | 5 | 11 | 4 | 0 | 1 | 0.13 | 0.33 | 0.25 |
| 15 | 17 | 2 | 5+ | 0 | 0 | 0 | 0.21 | 0.17 | -0.04 |
| 16 | 4+ | 7 | 13 | 0 | 0 | 0 | 0.17 | 0.67 | 0.46 |
| 17 | 4 | 5 | 13+ | 2 | 0 | 0 | 0.54 | -0.17 | 0.09 |
| 18 | 20 | 0 | 4+ | 0 | 0 | 0 | 0.17 | 0.50 | 0.44 |
| 19 | 3+ | 9 | 12 | 0 | 0 | 0 | 0.13 | 0.33 | 0.41 |
| 20 | 17 | 2 | 4+ | 1 | 0 | 0 | 0.17 | 0.17 | 0.17 |

Appendix C (continued)

| Item Number | Item Responses | | | | | | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Other | | | |
| 21 | 3+ | 0 | 1 | 20 | 0 | 0 | 0.13 | 0.50 | 0.63 |
| 22 | 7 | 0 | 13 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 |
| 23 | 0+ | 0 | 4 | 20 | 0 | 0 | 0.00 | 0.00 | 0.00 |
| 24 | 10+ | 0 | 10 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 |
| 25 | 7+ | 5 | 9 | 3 | 0 | 0 | 0.29 | -0.17 | 0.00 |
| 26 | 5 | 12 | 3+ | 4 | 0 | 0 | 0.13 | 0.17 | -0.10 |
| 27 | 0+ | 5 | 19 | 0 | 0 | 0 | 0.00 | 0.00 | -0.00 |
| 28 | 1 | 2 | 17+ | 4 | 0 | 0 | 0.71 | -0.17 | -0.00 |
| 29 | 13 | 0 | 5+ | 6 | 0 | 0 | 0.21 | 0.50 | 0.37 |
| 30 | 10+ | 0 | 8 | 6 | 0 | 0 | 0.42 | -0.17 | 0.02 |
| 31 | 14 | 3 | 5 | 2+ | 1 | 0 | 0.08 | 0.33 | 0.56 |
| 32 | 2 | 14 | 4+ | 4 | 0 | 0 | 0.17 | 0.17 | 0.21 |
| 33 | 10+ | 4 | 8 | 2 | 4 | 0 | 0.42 | 0.33 | 0.00 |
| 34 | 13 | 5 | 5+ | 1 | 12 | 0 | 0.21 | 0.17 | 0.10 |
| 35 | 20+ | 2 | 0 | 0 | 2+ | 2 | 0.83 | 0.33 | 0.28 |
| 36 | 2+ | 1 | 1 | 1 | 1 | 18 | 0.08 | 0.33 | 0.67 |
| 37 | 2 | 1 | 18 | 0 | 0 | 3 | 0.04 | 0.17 | 0.00 |
| 38 | 0 | 0 | 2+ | 1 | 4 | 17 | 0.08 | 0.33 | 0.67 |
| 39 | 3 | 1 | 2 | 0 | 12 | 6 | 1.00 | 0.00 | 0.00 |
| 40 | 4 | 0 | 1 | 13 | 2+ | 4 | 0.08 | 0.33 | 0.67 |
| 41 | 0 | 18 | 0 | 3+ | 1 | 2 | 0.13 | 0.50 | 0.79 |
| 42 | 0 | 1+ | 19 | 2 | 1 | 1 | 0.04 | 0.17 | 0.52 |
| 43 | 0 | 3 | 1+ | 2 | 0 | 19 | 0.04 | 0.17 | 0.52 |
| 44 | 0 | 3 | 2 | 2 | 16 | 1 | 0.04 | 0.17 | 0.00 |
| 45 | 1 | 18 | 0 | 0 | 3+ | 2 | 0.13 | 0.33 | 0.50 |

Appendix C (continued)

| Item Number | Item Responses | | | | | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | | | |
| 46 | 0 | 5+ | 0 | 3 | 3 | 13 | 0.21 | 0.33 | 0.41 |
| 47** | 4 | 2 | 0 | 12 | 0 | 6 | 1.00 | 0.00 | 0.00 |
| 48 | 0 | 0 | 0 | 19+ | 1 | 4 | 0.79 | -0.67 | -0.50 |
| 49 | 1 | 0 | 0 | 5+ | 0 | 18 | 0.21 | 0.50 | 0.45 |
| 50 | 14 | 0 | 0 | 6 | 0 | 4 | 0.17 | 0.67 | 0.00 |
| 51 | 20+ | 1 | 0 | 1 | 0 | 2 | 0.83 | -0.33 | -0.26 |
| 52 | 20+ | 0 | 1 | 1 | 1 | 1 | 0.83 | 0.33 | 0.27 |
| 53 | 22+ | 0 | 1 | 0 | 0 | 1 | 0.92 | 0.17 | 0.18 |
| 54 | 6+ | 3 | 12+ | 1 | 1 | 1 | 0.25 | 0.83 | 0.70 |
| 55 | 5 | 8 | 7+ | 0 | 3 | 1 | 0.29 | 0.50 | 0.41 |
| 56 | 1 | 1+ | 1 | 18 | 2 | 1 | 0.04 | 0.17 | 0.38 |
| 57 | 1 | 5 | 1 | 8+ | 7 | 2 | 0.33 | 0.17 | 0.21 |
| 58 | 0 | 14 | 0 | 3 | 5+ | 2 | 0.21 | 0.17 | 0.13 |
| 59 | 16 | 1+ | 0 | 1 | 4 | 2 | 0.04 | 0.17 | 0.52 |
| 60 | 2+ | 0 | 13 | 3 | 4 | 2 | 0.98 | 0.33 | 0.56 |
| 61 | 2 | 2 | 3+ | 12 | 4 | 1 | 0.13 | 0.50 | 0.79 |
| 62 | 17 | 3 | 2 | 0+ | 2 | 0 | 0.00 | 0.00 | 0.00 |
| 63 | 7+ | 11 | 1 | 3 | 1 | 1 | 0.29 | 0.50 | 0.48 |
| 64 | 18 | 2+ | 1 | 3 | 0 | 0 | 0.08 | 0.33 | 0.46 |
| 65 | 5+ | 17 | 0 | 1 | 0 | 1 | 0.21 | 0.17 | 0.19 |
| 66 | 3 | 4+ | 16 | 1 | 0 | 0 | 0.17 | 0.33 | 0.37 |
| 67 | 2 | 17 | 3+ | | 0 | 1 | 0.13 | 0.50 | 0.79 |
| 68 | 6 | 2+ | 8 | 7 | 0 | 1 | 0.08 | 0.33 | 0.56 |
| 69 | 2 | 1 | 1 | 19+ | 0 | 1 | 0.79 | -0.33 | -0.42 |
| 70 | 11 | 2 | 3 | 6+ | 0 | 2 | 0.25 | 0.50 | 0.37 |

Appendix C (continued)

| Item Number | - Item Responses - | | | | | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | | | |
| 71 | 3+ | 6 | 10 | 2 | 1 | 2 | 0.13 | 0.50 | 0.55 |
| 72 | 19 | 1 | 3+ | 0 | 0 | 1 | 0.13 | 0.50 | 0.79 |
| 73 | 2+ | 1 | 19 | 1 | 0 | 1 | 0.08 | 0.33 | 0.56 |
| 74 | 2 | 11 | 2+ | 8 | 0 | 1 | 0.08 | 0.33 | 0.56 |
| 75 | 0 | 0+ | 0 | 0 | 0 | 24 | 0.00 | 0.00 | 0.00 |
| 76 | 10 | 12+ | 0 | 0 | 0 | 2 | 0.50 | 0.17 | 0.17 |
| 77 | 0 | 5 | 1 | 14 | 2+ | 2 | 0.08 | 0.00 | 0.03 |
| 78 | 0 | 0 | 21+ | 1 | 0 | 2 | 0.88 | 0.33 | 0.46 |
| 79 | 1+ | 3 | 0 | 18+ | 0 | 2 | 0.75 | 0.17 | 0.08 |
| 80 | 21+ | 0 | 1 | 0 | 0 | 2 | 0.88 | 0.33 | 0.46 |
| 81 | 1 | 16+ | 2 | 3 | 0 | 2 | 0.67 | 0.00 | -0.05 |
| 82 | 0 | 0 | 20+ | 2 | 0 | 2 | 0.83 | 0.33 | 0.45 |
| 83 | 2 | 16+ | 4 | 0 | 0 | 2 | 0.67 | 0.50 | 0.42 |
| 84 | 2 | 14+ | 5 | 1 | 0 | 2 | 0.58 | 0.17 | 0.11 |
| 85 | 2 | 3 | 17+ | 0 | 0 | 2 | 0.71 | 0.50 | 0.39 |
| 86 | 2 | 19+ | 0 | 0 | 0 | 3 | 0.79 | 0.33 | 0.20 |
| 87 | 7 | 2 | 12+ | 0 | 0 | 3 | 0.50 | 0.17 | 0.12 |
| 88 | 3 | 4 | 14+ | 0 | 0 | 3 | 0.58 | 0.67 | 0.35 |
| 89 | 2 | 5 | 14+ | 0 | 0 | 3 | 0.58 | 0.67 | 0.35 |
| 90 | 0 | 15+ | 4 | 1 | 0 | 4 | 0.63 | 0.17 | 0.08 |
| 91 | 3 | 13+ | 3 | 0 | 0 | 5 | 0.54 | 0.00 | -0.05 |
| 92 | 2 | 13+ | 3 | 1 | 0 | 5 | 0.54 | 0.17 | 0.24 |

+ - Indicates Correct Answer
** - Indicates Everyone Given Credit
* - Indicates Question Thrown Out

Appendix C (continued)

## PILOT STUDY II

| | |
|---|---|
| Number of Students Taking Test | 33.00 |
| Total Number of Items on Exam | 45.00 |
| Range of Scores --- High = | 40.00 |
| --- Low = | 24.00 |
| Highest Possible Score | 45.00 |
| Mean (Average) Raw Score | 34.61 |
| Median (Middle) Raw Score | 35.00 |
| Mode (Most Frequent) Raw Score | 33.00 |
| Standard Deviation (Raw Score) | 4.66 |
| Standard Error of Measurement | 2.41 |
| Kuker-Richardson 20 Correlation | 0.73 *chk* |
| Number Used for Disc Index | 8.00 |

## Frequency Distribution of Scores

| Raw Score | Percent Score | Fre- quency | Z Score | Percentile Rank | Numerical Rank |
|---|---|---|---|---|---|
| 24 | 53.33 | 2 | -2.28 | 3.03 | 32 |
| 25 | 55.56 | 1 | -2.06 | 7.58 | 31 |
| 29 | 64.44 | 1 | -1.20 | 10.61 | 30 |
| 30 | 66.67 | 1 | -0.99 | 13.64 | 29 |
| 31 | 68.89 | 2 | -0.77 | 18.18 | 27 |
| 32 | 71.11 | 2 | -0.56 | 24.24 | 25 |
| 33 | 73.33 | 5 | -0.34 | 34.85 | 20 |
| 34 | 75.56 | 2 | -0.13 | 45.45 | 18 |
| 35 | 77.78 | 1 | 0.08 | 50.00 | 17 |
| 36 | 80.00 | 2 | 0.30 | 54.55 | 15 |
| 37 | 82.22 | 1 | 0.51 | 59.09 | 14 |
| 38 | 84.44 | 5 | 0.73 | 68.18 | 9 |
| 39 | 86.67 | 3 | 0.94 | 80.30 | 6 |
| 40 | 88.89 | 5 | 1.16 | 92.42 | 1 |

Appendix C (continued)

CA GATER PA

ITEM ANALYSIS PAGE 1 -- Item Response Figures Are Totals, Not Percentages

| Item Number | Item Responses | | | | | | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Other | | | |
| 1 | 0 | 1 | 1 | 31+ | 0 | 0 | 0.04 | 0.25 | 0.20 |
| 2 | 15 | 11+ | 3 | 4 | 0 | 0 | 0.33 | -0.13 | -0.04 |
| 3 | 4 | 7 | 20+ | 2 | 0 | 0 | 0.61 | 0.38 | 0.32 |
| 4 | 1 | 3 | 6 | 23+ | 0 | 0 | 0.70 | 0.25 | 0.33 |
| 5 | 9 | 22+ | 1 | 1 | 0 | 0 | 0.67 | 0.50 | 0.26 |
| 6 | 23+ | 9 | 1 | 0 | 0 | 0 | 0.70 | 0.38 | 0.34 |
| 7 | 11+ | 13 | 8 | 1 | 0 | 5 | 0.33 | 0.50 | 0.39 |
| 8 | 21+ | 0 | 7 | 0 | 0 | 5 | 0.64 | 0.50 | 0.41 |
| 9 | 0 | 13 | 15+ | 0 | 0 | 5 | 0.45 | 0.50 | 0.47 |
| 10 | 18 | 2 | 8+ | 0 | 0 | 5 | 0.24 | 0.13 | 0.17 |
| 11 | 13+ | 0 | 15 | 0 | 0 | 5 | 0.39 | 0.63 | 0.47 |
| 12 | 1 | 22+ | 5 | 8 | 0 | 5 | 0.68 | 0.63 | 0.42 |
| 13 | 0 | 20+ | 5 | 0 | 0 | 0 | 0.61 | 0.13 | 0.13 |
| 14 | 2 | 0 | 31+ | 0 | 0 | 0 | 0.94 | 0.00 | -0.08 |
| 15 | 0 | 27+ | 6 | 0 | 0 | 0 | 0.82 | 0.25 | 0.13 |
| 16 | 7 | 1 | 25+ | 0 | 0 | 0 | 0.76 | 0.13 | 0.23 |
| 17 | 30+ | 1 | 1 | 1 | 0 | 0 | 0.91 | 0.25 | 0.24 |
| 18 | 0 | 0 | 0 | 1 | 32+ | 0 | 0.97 | 0.00 | 0.02 |
| 19 | 0 | 33+ | 0 | 0 | 0 | 0 | 1.00 | 0.00 | 0.00 |
| 20 | 0 | 0 | 0 | 33+ | 0 | 0 | 1.00 | 0.00 | 0.00 |
| 21 | 0 | 0 | 33+ | 0 | 0 | 0 | 1.00 | 0.00 | 0.00 |
| 22 | 32+ | 1 | 0 | 0 | 0 | 0 | 0.97 | 0.13 | 0.14 |
| 23 | 0 | 0 | 33+ | 0 | 0 | 0 | 1.00 | 0.00 | 0.00 |
| 24 | 0 | 0 | 0 | 5 | 28+ | 0 | 0.85 | 0.38 | 0.38 |
| 25 | 0 | 33+ | 0 | 0 | 0 | 0 | 1.00 | 0.00 | 0.00 |

Appendix C (continued)

| Item Number | Item Responses | | | | | | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Other | | | |
| 26 | 0 | 0 | 0 | 32+ | 1 | 0 | 0.97 | 0.13 | 0.40 |
| 27 | 31+ | 0 | 0 | 2 | 0 | 0 | 0.94 | 0.13 | 0.33 |
| 28 | 0 | 1 | 26+ | 4 | 2 | 0 | 0.79 | 0.50 | 0.55 |
| 29 | 5 | 21+ | 3 | 2 | 2 | 0 | 0.64 | 0.38 | 0.23 |
| 30 | 26+ | 1 | 0 | 2 | 4 | 0 | 0.79 | 0.38 | 0.42 |
| 31 | 0 | 0 | 31+ | 0 | 2 | 0 | 0.94 | 0.13 | 0.25 |
| 32 | 1 | 3 | 0 | 25+ | 4 | 0 | 0.76 | 0.75 | 0.53 |
| 33 | 14+ | 19 | 0 | 0 | 4 | 0 | 0.42 | 0.00 | 0.02 |
| 34 | 6 | 25+ | 0 | 2 | 0 | 0 | 0.76 | 0.50 | 0.51 |
| 35 | 4 | 26+ | 0 | 3 | 0 | 0 | 0.79 | 0.25 | 0.32 |
| 36 | 32+ | 0 | 0 | 1 | 0 | 0 | 0.97 | 0.13 | 0.40 |
| 37 | 1 | 5 | 27+ | 0 | 0 | 0 | 0.82 | 0.50 | 0.65 |
| 38 | 30+ | 3 | 0 | 0 | 0 | 0 | 0.91 | 0.00 | 0.06 |
| 39 | 0 | 0 | 32+ | 1 | 0 | 0 | 0.97 | 0.00 | 0.02 |
| 40 | 0 | 12 | 0 | 21+ | 0 | 0 | 0.64 | 0.50 | 0.45 |
| 41 | 27+ | 5 | 1 | 0 | 0 | 0 | 0.82 | 0.00 | -0.07 |
| 42 | 0 | 22+ | 1 | 10 | 0 | 0 | 0.67 | 0.38 | 0.30 |
| 43 | 4 | 1 | 28+ | 0 | 0 | 0 | 0.85 | 0.25 | 0.35 |
| 44 | 1 | 28+ | 4 | 0 | 0 | 0 | 0.85 | 0.13 | 0.24 |
| 45 | 5 | 28+ | 0 | 0 | 0 | 0 | 0.85 | 0.38 | 0.49 |

+ - Indicates Correct Answer
** - Indicates Everyone Given Credit
* - Indicates Question Thrown Out

Appendix C (continued)                    GATER-K RESULTS

| | |
|---|---|
| Number of Students Taking Test | 168.00 |
| Total Number of Items on Exam | 100.00 |
| Range of Scores --- High = | 76.00 |
|      --- Low = | 17.00 |
| Highest Possible Score | 100.00 |
| Mean (Average) Raw Score | 46.71 |
| Median (Middle) Raw Score | 50.00 |
| Mode (Most Frequent) Raw Score | 50.00 |
| Standard Deviation (Raw Score) | 14.28 |
| Standard Error of Measurement | 4.45 |
| Kuder-Richardson 20 Correlation | 0.90 gen |
| Number Used for Disc Index | 45.00 |

### Frequency Distribution of Scores

| Raw Score | Percent Score | Fre-quency | Z Score | Percentile Rank | Numerical Rank |
|---|---|---|---|---|---|
| 17 | 17.00 | 1 | -2.08 | 0.30 | 168 |
| 18 | 18.00 | 2 | -2.01 | 1.19 | 166 |
| 19 | 19.00 | 1 | -1.94 | 2.08 | 165 |
| 20 | 20.00 | 1 | -1.87 | 2.68 | 164 |
| 22 | 22.00 | 7 | -1.73 | 5.06 | 157 |
| 23 | 23.00 | 2 | -1.66 | 7.74 | 155 |
| 24 | 24.00 | 4 | -1.59 | 9.52 | 151 |
| 25 | 25.00 | 3 | -1.52 | 11.61 | 148 |
| 26 | 26.00 | 1 | -1.45 | 12.80 | 147 |
| 27 | 27.00 | 5 | -1.38 | 14.58 | 142 |
| 28 | 28.00 | 4 | -1.31 | 17.26 | 138 |
| 29 | 29.00 | 1 | -1.24 | 18.75 | 137 |
| 30 | 30.00 | 1 | -1.17 | 19.35 | 136 |
| 31 | 31.00 | 2 | -1.10 | 20.24 | 134 |
| 32 | 32.00 | 1 | -1.03 | 21.13 | 133 |
| 33 | 33.00 | 1 | -0.96 | 21.73 | 132 |
| 34 | 34.00 | 1 | -0.89 | 22.32 | 131 |
| 35 | 35.00 | 4 | -0.82 | 23.81 | 127 |
| 36 | 36.00 | 2 | -0.75 | 25.60 | 125 |
| 37 | 37.00 | 2 | -0.68 | 26.79 | 123 |
| 39 | 39.00 | 3 | -0.54 | 28.27 | 120 |
| 40 | 40.00 | 1 | -0.47 | 29.46 | 119 |
| 41 | 41.00 | 3 | -0.40 | 30.65 | 116 |
| 42 | 42.00 | 3 | -0.33 | 32.44 | 113 |
| 43 | 43.00 | 3 | -0.26 | 34.23 | 110 |

Appendix C (continued)

Frequency Distribution of Scores

| Raw Score | Percent Score | Fre-quency | Z Score | Percentile Rank | Numerical Rank |
|-----------|---------------|------------|---------|-----------------|----------------|
| 45 | 45.00 | 3 | -0.12 | 36.01 | 107 |
| 46 | 46.00 | 4 | -0.05 | 38.10 | 103 |
| 47 | 47.00 | 6 | 0.02 | 41.07 | 97 |
| 48 | 48.00 | 5 | 0.09 | 44.35 | 92 |
| 49 | 49.00 | 5 | 0.16 | 47.32 | 87 |
| 50 | 50.00 | 8 | 0.23 | 51.19 | 79 |
| 51 | 51.00 | 7 | 0.30 | 55.65 | 72 |
| 52 | 52.00 | 7 | 0.37 | 59.82 | 65 |
| 53 | 53.00 | 6 | 0.44 | 63.69 | 59 |
| 54 | 54.00 | 4 | 0.51 | 66.67 | 55 |
| 55 | 55.00 | 7 | 0.58 | 69.94 | 48 |
| 56 | 56.00 | 1 | 0.65 | 72.32 | 47 |
| 57 | 57.00 | 3 | 0.72 | 73.51 | 44 |
| 58 | 58.00 | 5 | 0.79 | 75.89 | 39 |
| 59 | 59.00 | 8 | 0.86 | 79.76 | 31 |
| 60 | 60.00 | 4 | 0.93 | 83.33 | 27 |
| 61 | 61.00 | 1 | 1.00 | 84.82 | 26 |
| 62 | 62.00 | 4 | 1.07 | 86.81 | 22 |
| 63 | 63.00 | 3 | 1.14 | 88.39 | 19 |
| 64 | 64.00 | 2 | 1.21 | 89.88 | 17 |
| 65 | 65.00 | 4 | 1.28 | 91.67 | 13 |
| 66 | 66.00 | 3 | 1.35 | 93.75 | 10 |
| 67 | 67.00 | 2 | 1.42 | 95.24 | 8 |
| 68 | 68.00 | 2 | 1.49 | 96.43 | 6 |
| 69 | 69.00 | 1 | 1.56 | 97.32 | 5 |
| 70 | 70.00 | 1 | 1.63 | 97.92 | 4 |
| 72 | 72.00 | 1 | 1.77 | 98.51 | 3 |
| 74 | 74.00 | 1 | 1.91 | 99.11 | 2 |
| 76 | 76.00 | 1 | 2.05 | 99.70 | 1 |

Appendix C (continued)

| Item Number | 1 | 2 | 3 | 4 | 5 | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 14 | 6 | 5 | 129+ | 14 | 0 | 0.77 | 0.56 | 0.53 |
| 2 | 25 | 59 | 54+ | 30 | 0 | 0 | 0.32 | 0.02 | -0.05 |
| 3 | 17 | 6 | 26 | 116+ | 0 | 3 | 0.69 | 0.67 | 0.58 |
| 4 | 36 | 110+ | 11 | 10 | 0 | 1 | 0.65 | 0.58 | 0.47 |
| 5 | 7 | 7 | 113+ | 9 | 32 | 0 | 0.67 | 0.78 | 0.64 |
| 6 | 30 | 85+ | 17 | 29 | 7 | 0 | 0.51 | 0.67 | 0.52 |
| 7 | 18 | 28 | 27 | 93+ | 0 | 2 | 0.55 | 0.60 | 0.40 |
| 8 | 7 | 122+ | 9 | 26 | 3 | 1 | 0.73 | 0.18 | 0.21 |
| 9 | 54 | 18 | 46+ | 50 | 0 | 0 | 0.27 | 0.24 | 0.23 |
| 10 | 4 | 76 | 54+ | 33 | 0 | 1 | 0.32 | 0.07 | 0.05 |
| 11 | 38 | 67 | 10 | 53+ | 0 | 0 | 0.32 | 0.49 | 0.38 |
| 12 | 19+ | 32 | 48 | 64 | 1 | 4 | 0.11 | 0.02 | 0.01 |
| 13 | 4 | 7 | 34 | 123+ | 0 | 0 | 0.73 | 0.20 | 0.23 |
| 14 | 22 | 26 | 57+ | 38 | 25 | 0 | 0.34 | 0.47 | 0.40 |
| 15 | 23 | 57 | 46 | 41+ | 1 | 0 | 0.24 | -0.09 | -0.06 |
| 16 | 35 | 7 | 14 | 109+ | 1 | 2 | 0.65 | 0.22 | 0.15 |
| 17 | 19 | 25+ | 18 | 106 | 0 | 0 | 0.15 | -0.11 | -0.09 |
| 18 | 8 | 41 | 21 | 96+ | 1 | 1 | 0.57 | 0.51 | 0.39 |
| 19 | 7 | 106+ | 17 | 16 | 21 | 1 | 0.63 | 0.73 | 0.56 |
| 20 | 16 | 8 | 76+ | 65 | 2 | 1 | 0.45 | 0.60 | 0.48 |
| 21 | 20 | 23+ | 69 | 56 | 0 | 0 | 0.14 | 0.16 | 0.22 |
| 22 | 28 | 11 | 34 | 93+ | 1 | 1 | 0.55 | 0.71 | 0.53 |
| 23 | 13 | 129+ | 19 | 7 | 0 | 0 | 0.77 | 0.67 | 0.68 |
| 24 | 3 | 118+ | 15 | 24 | 8 | 0 | 0.70 | 0.64 | 0.54 |
| 25 | 59 | 9 | 86+ | 14 | 0 | 0 | 0.51 | 0.53 | 0.37 |

Appendix C (continued)

| Item Number | — Item Responses — | | | | | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | | | |
| 26 | 18 | 7 | 99+ | 44 | 0 | 0 | 0.59 | 0.33 | 0.29 |
| 27 | 40 | 32 | 37 | 55+ | 0 | 4 | 0.33 | 0.51 | 0.45 |
| 28 | 4 | 110+ | 13 | 13 | 2 | 0 | 0.65 | 0.04 | 0.06 |
| 29 | 18 | 6 | 79+ | 64 | 1 | 0 | 0.47 | 0.31 | 0.22 |
| 30 | 59 | 22+ | 58 | 27 | 0 | 2 | 0.13 | 0.00 | 0.02 |
| 31 | 58 | 49+ | 29 | 32 | 0 | 0 | 0.29 | 0.18 | 0.16 |
| 32 | 11 | 82+ | 50 | 22 | 0 | 3 | 0.49 | 0.53 | 0.42 |
| 33 | 20 | 23 | 88+ | 37 | 0 | 0 | 0.52 | 0.40 | 0.34 |
| 34 | 20 | 69+ | 27 | 49 | 2 | 1 | 0.41 | 0.56 | 0.42 |
| 35 | 26 | 22 | 47 | 71+ | 0 | 2 | 0.42 | 0.58 | 0.39 |
| 36 | 10 | 45 | 80+ | 32 | 1 | 0 | 0.48 | 0.33 | 0.29 |
| 37 | 86+ | 27 | 27 | 26 | 0 | 2 | 0.51 | 0.80 | 0.60 |
| 38 | 13 | 41 | 38 | 75+ | 0 | 1 | 0.45 | 0.38 | 0.27 |
| 39 | 16 | 124+ | 23 | 5 | 0 | 0 | 0.74 | 0.73 | 0.68 |
| 40 | 27 | 38 | 22 | 80+ | 0 | 1 | 0.48 | 0.49 | 0.41 |
| 41 | 36 | 65 | 67+ | 0 | 0 | 0 | 0.40 | 0.16 | 0.17 |
| 42 | 56+ | 21 | 24 | 67 | 0 | 0 | 0.33 | 0.29 | 0.21 |
| 43 | 30 | 89+ | 46 | 3 | 0 | 0 | 0.53 | 0.33 | 0.25 |
| 44 | 85+ | 23 | 24 | 36 | 0 | 0 | 0.51 | 0.31 | 0.27 |
| 45 | 21 | 21 | 106+ | 20 | 0 | 0 | 0.63 | 0.76 | 0.63 |
| 46 | 33 | 53+ | 35 | 46 | 1 | 0 | 0.32 | 0.42 | 0.34 |
| 47 | 20 | 107+ | 25 | 13 | 0 | 3 | 0.64 | 0.36 | 0.28 |
| 48 | 23 | 96+ | 16 | 26 | 7 | 0 | 0.57 | 0.84 | 0.62 |
| 49 | 117+ | 13 | 6 | 32 | 0 | 0 | 0.70 | 0.60 | 0.52 |
| 50 | 35+ | 28 | 87 | 18 | 0 | 0 | 0.21 | 0.07 | 0.10 |

Appendix C (continued)

| Item Number | 1 | 2 | 3 | 4 | 5 | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | | | Item Responses | | | | | | |
| 51 | 78 | 49+ | 22 | 19 | 0 | 0 | 0.29 | -0.09 | -0.09 |
| 52 | 56 | 25 | 46+ | 41 | 0 | 0 | 0.27 | -0.11 | -0.04 |
| 53 | 48 | 17 | 86+ | 17 | 0 | 0 | 0.51 | 0.42 | 0.35 |
| 54 | 22 | 16 | 100+ | 29 | 0 | 0 | 0.60 | 0.47 | 0.44 |
| 55 | 27 | 62+ | 13 | 66 | 0 | 0 | 0.37 | 0.20 | 0.17 |
| 56 | 37+ | 19 | 76 | 36 | 0 | 0 | 0.22 | 0.33 | 0.29 |
| 57 | 39 | 38 | 61+ | 30 | 0 | 1 | 0.36 | 0.22 | 0.19 |
| 58 | 2 | 21 | 33 | 111+ | 0 | 1 | 0.66 | 0.64 | 0.55 |
| 59 | 60+ | 16 | 54 | 37 | 0 | 1 | 0.36 | 0.27 | 0.26 |
| 60 | 42 | 83+ | 32 | 9 | 1 | 1 | 0.49 | 0.51 | 0.37 |
| 61 | 58 | 40 | 16 | 54+ | 0 | 0 | 0.32 | 0.97 | -0.02 |
| 62 | 57 | 49+ | 43 | 16 | 0 | 3 | 0.29 | 0.09 | 0.25 |
| 63 | 14 | 30 | 118+ | 6 | 0 | 0 | 0.70 | 0.09 | 0.06 |
| 64 | 19 | 99+ | 15 | 35 | 0 | 0 | 0.59 | 0.13 | 0.17 |
| 65 | 18 | 125+ | 19 | 5 | 0 | 1 | 0.74 | 0.38 | 0.38 |
| 66 | 24 | 57 | 13 | 72+ | 1 | 1 | 0.43 | 0.11 | 0.07 |
| 67 | 76+ | 28 | 22 | 38 | 0 | 4 | 0.45 | 0.60 | 0.47 |
| 68 | 9 | 106+ | 40 | 11 | 0 | 2 | 0.63 | 0.31 | 0.25 |
| 69 | 0 | 20+ | 55 | 84 | 0 | 0 | 0.12 | -0.20 | -0.25 |
| 70 | 52+ | 45 | 28 | 27 | 1 | 15 | 0.31 | 0.00 | 0.03 |
| 71 | 17 | 12 | 32+ | 105 | 1 | 1 | 0.19 | 0.36 | 0.29 |
| 72 | 48 | 26 | 31 | 61+ | 1 | 0 | 0.36 | 0.04 | 0.01 |
| 73 | 40 | 2 | 106+ | 20 | 0 | 0 | 0.63 | 0.22 | 0.17 |
| 74 | 11 | 65+ | 38 | 54 | 0 | 0 | 0.39 | 0.24 | 0.23 |
| 75 | 13 | 131+ | 5 | 8 | 9 | 2 | 0.78 | 0.62 | 0.59 |

Appendix C (continued)

| Item Number | 1 | 2 | — Item Responses — 3 | 4 | 5 | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| 76 | 9 | 89+ | 10 | 60 | 0 | 0 | 0.53 | -0.22 | -0.22 |
| 77 | 56+ | 19 | 27 | 63 | 0 | 3 | 0.33 | 0.09 | 0.05 |
| 78 | 21 | 55 | 14 | 77+ | 0 | 1 | 0.46 | 0.71 | 0.53 |
| 79 | 13 | 20 | 13 | 120+ | 1 | 1 | 0.71 | 0.67 | 0.58 |
| 80 | 27 | 6 | 67+ | 65 | 2 | 1 | 0.40 | 0.64 | 0.51 |
| 81 | 3 | 25 | 80+ | 59 | 1 | 0 | 0.48 | 0.56 | 0.42 |
| 82 | 32 | 66 | 58 | 11+ | 1 | 0 | 0.07 | -0.02 | 0.01 |
| 83 | 36 | 35 | 13 | 84+ | 0 | 0 | 0.50 | 0.64 | 0.49 |
| 84 | 7 | 17 | 126 | 17+ | 1 | 1 | 0.10 | 0.13 | 0.17 |
| 85 | 62 | 13 | 82+ | 11 | 0 | 0 | 0.49 | 0.22 | 0.23 |
| 86 | 63+ | 51 | 35 | 18 | 0 | 1 | 0.38 | 0.49 | 0.33 |
| 87 | 17 | 60+ | 13 | 73 | 0 | 5 | 0.36 | 0.29 | 0.22 |
| 88 | 8 | 101+ | 42 | 15 | 0 | 2 | 0.60 | 0.78 | 0.62 |
| 89 | 15 | 18 | 13 | 121+ | 0 | 1 | 0.72 | 0.69 | 0.62 |
| 90 | 15 | 115+ | 18 | 16 | 2 | 2 | 0.68 | 0.44 | 0.41 |
| 91 | 44+ | 16 | 94 | 12 | 0 | 2 | 0.26 | 0.27 | 0.23 |
| 92 | 19 | 6 | 10 | 127+ | 3 | 3 | 0.76 | 0.58 | 0.54 |
| 93 | 75+ | 15 | 6 | 70 | 0 | 2 | 0.45 | -0.18 | -0.10 |
| 94 | 38 | 76+ | 22 | 30 | 0 | 2 | 0.45 | 0.58 | 0.45 |
| 95 | 8 | 37 | 45 | 77+ | 0 | 1 | 0.46 | 0.11 | 0.05 |
| 96 | 19 | 10 | 18 | 120+ | 0 | 1 | 0.71 | 0.67 | 0.57 |
| 97 | 20 | 96+ | 5 | 40 | 0 | 7 | 0.57 | 0.71 | 0.56 |
| 98 | 9 | 82 | 11 | 63+ | 0 | 3 | 0.38 | 0.47 | 0.37 |
| 99 | 56+ | 38 | 18 | 28 | 24 | 4 | 0.33 | 0.20 | 0.24 |
| 100 | 56 | 37 | 14 | 53+ | 1 | 7 | 0.32 | 0.16 | 0.12 |

+ - Indicates Correct Answer      ** - Indicates Eveyone Given Credit      * - Indicates Question Thrown Out

Appendix C (continued)

## GATER-P RESULTS

| | |
|---|---|
| Number of Students | 168.00 |
| Total Number of Items on Exam | 45.00 |
| Range of Scores --- High = | 38.00 |
| --- Low = | 6.00 |
| Highest Possible Score | 45.00 |
| Mean (Average) Raw Score | 25.26 |
| Median (Middle) Raw Score | 27.00 |
| Mode (Most Frequent) Raw Score | 29.00 |
| Standard Deviation (Raw Score) | 6.16 |
| Standard Error of Measurement | 2.94 |
| Kuder-Richardson 20 Correlation | 0.77 chh |
| Number Used for Disc Index | 68.00 |

### Frequency Distribution of Scores

| Raw Score | Percent Score | Fre-quency | Z Score | Percentile Rank | Numerical Rank |
|---|---|---|---|---|---|
| 6 | 13.33 | 1 | -3.13 | 0.30 | 168 |
| 7 | 15.56 | 1 | -2.97 | 0.89 | 167 |
| 10 | 22.22 | 1 | -2.48 | 1.49 | 166 |
| 11 | 24.44 | 1 | -2.32 | 2.08 | 165 |
| 13 | 28.89 | 2 | -1.99 | 2.98 | 163 |
| 14 | 31.11 | 4 | -1.83 | 4.76 | 159 |
| 15 | 33.33 | 3 | -1.67 | 6.85 | 156 |
| 16 | 35.56 | 4 | -1.50 | 8.93 | 152 |
| 17 | 37.78 | 3 | -1.34 | 11.01 | 149 |
| 18 | 40.00 | 5 | -1.18 | 13.39 | 144 |
| 19 | 42.22 | 4 | -1.02 | 16.07 | 140 |
| 20 | 44.44 | 7 | -0.85 | 19.35 | 133 |
| 21 | 46.67 | 8 | -0.69 | 23.81 | 125 |
| 22 | 48.89 | 9 | -0.53 | 28.87 | 116 |
| 23 | 51.11 | 9 | -0.37 | 34.23 | 107 |
| 24 | 53.33 | 7 | -0.20 | 38.99 | 100 |
| 25 | 55.56 | 8 | -0.04 | 43.45 | 92 |
| 26 | 57.78 | 6 | 0.12 | 47.62 | 86 |
| 27 | 60.00 | 12 | 0.28 | 52.98 | 74 |
| 28 | 62.22 | 12 | 0.45 | 60.12 | 62 |
| 29 | 64.44 | 19 | 0.61 | 69.35 | 43 |
| 30 | 66.67 | 13 | 0.77 | 78.87 | 30 |
| 31 | 68.89 | 6 | 0.93 | 84.52 | 24 |
| 32 | 71.11 | 4 | 1.10 | 87.50 | 20 |
| 33 | 73.33 | 7 | 1.26 | 90.77 | 13 |
| 34 | 75.56 | 7 | 1.42 | 94.94 | 6 |
| 35 | 77.78 | 2 | 1.58 | 97.62 | 4 |
| 36 | 80.00 | 2 | 1.75 | 98.81 | 2 |
| 38 | 84.44 | 1 | 2.07 | 99.70 | 1 |

Appendix C (continued)

| Item Number | 1 | 2 | 3 | 4 | 5 | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 8 | 0 | 1 | 14 | 144+ | 1 | 0.96 | 0.22 | 0.32 |
| 2 | 5 | 154+ | 4 | 4 | 0 | 1 | 0.92 | 0.21 | 0.42 |
| 3 | 5 | 2 | 15 | 127+ | 19 | 0 | 0.76 | 0.32 | 0.42 |
| 4 | 15 | 3 | 138+ | 8 | 4 | 0 | 0.82 | 0.21 | 0.26 |
| 5 | 149+ | 2 | 10 | 3 | 2 | 2 | 0.89 | 0.18 | 0.32 |
| 6 | 11 | 4 | 148+ | 3 | 2 | 0 | 0.88 | 0.22 | 0.34 |
| 7 | 2 | 1 | 2 | 46 | 117+ | 0 | 0.70 | 0.29 | 0.41 |
| 8 | 10 | 148+ | 7 | 3 | 0 | 0 | 0.88 | 0.21 | 0.33 |
| 9 | 8 | 3 | 1 | 149+ | 7 | 0 | 0.89 | 0.19 | 0.44 |
| 10 | 109+ | 4 | 14 | 32 | 9 | 0 | 0.65 | 0.32 | 0.36 |
| 11 | 112+ | 50 | 4 | 0 | 1 | 1 | 0.67 | 0.53 | 0.57 |
| 12 | 1 | 12 | 105+ | 49 | 0 | 1 | 0.63 | 0.51 | 0.50 |
| 13 | 12 | 62 | 3 | 90+ | 9 | 1 | 0.54 | 0.04 | 0.14 |
| 14 | 118+ | 33 | 9 | 6 | 1 | 1 | 0.70 | 0.46 | 0.49 |
| 15 | 5 | 70+ | 23 | 69 | 0 | 1 | 0.42 | 0.43 | 0.45 |
| 16 | 6 | 11 | 14 | 134+ | 2 | 1 | 0.80 | 0.29 | 0.39 |
| 17 | 57 | 77+ | 21 | 12 | 0 | 1 | 0.46 | 0.16 | 0.16 |
| 18 | 21 | 50 | 77+ | 18 | 1 | 1 | 0.46 | 0.07 | 0.15 |
| 19 | 14 | 19 | 50 | 83+ | 1 | 1 | 0.49 | 0.32 | 0.31 |
| 20 | 70 | 72+ | 16 | 4 | 1 | 5 | 0.43 | 0.18 | 0.21 |
| 21 | 89+ | 60 | 9 | 5 | 0 | 5 | 0.53 | 0.35 | 0.40 |
| 22 | 29+ | 62 | 61 | 9 | 0 | 7 | 0.17 | 0.07 | 0.10 |
| 23 | 61 | 26 | 71+ | 6 | 1 | 3 | 0.42 | 0.18 | 0.16 |
| 24 | 19 | 70+ | 74 | 2 | 1 | 2 | 0.42 | 0.16 | 0.22 |
| 25 | 33 | 86+ | 35 | 11 | 1 | 2 | 0.51 | 0.22 | 0.21 |

Appendix C (continued)

| Item Number | - Item Responses - | | | | | Other | Item Difficulty | Item Discrimination | Point Biserial Correlation |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | | | |
| 26 | 14 | 23 | 72+ | 19 | 33 | 7 | 0.43 | 0.34 | 0.34 |
| 27 | 24 | 33+ | 32 | 17 | 58 | 4 | 0.20 | 0.03 | 0.06 |
| 28 | 95+ | 12 | 16 | 21 | 20 | 4 | 0.57 | 0.43 | 0.39 |
| 29 | 21 | 7 | 104+ | 9 | 24 | 3 | 0.62 | 0.41 | 0.41 |
| 30 | 7 | 31 | 12 | 52+ | 62 | 4 | 0.31 | 0.43 | 0.36 |
| 31 | 20 | 90+ | 36 | 15 | 0 | 7 | 0.54 | 0.31 | 0.32 |
| 32 | 1 | 6 | 152+ | 2 | 0 | 7 | 0.90 | 0.24 | 0.48 |
| 33 | 7 | 106+ | 30 | 15 | 0 | 10 | 0.63 | 0.28 | 0.36 |
| 34 | 44 | 30 | 52+ | 30 | 1 | 11 | 0.31 | 0.09 | 0.18 |
| 35 | 90+ | 28 | 18 | 20 | 0 | 12 | 0.54 | 0.26 | 0.30 |
| 36 | 92+ | 55 | 11 | 4 | 0 | 6 | 0.55 | 0.37 | 0.33 |
| 37 | 19 | 102+ | 21 | 18 | 1 | 7 | 0.61 | 0.44 | 0.45 |
| 38 | 41 | 86+ | 8 | 27 | 0 | 6 | 0.51 | 0.32 | 0.30 |
| 39 | 98+ | 10 | 25 | 25 | 2 | 8 | 0.58 | 0.40 | 0.37 |
| 40 | 14 | 64 | 70+ | 12 | 0 | 8 | 0.42 | 0.34 | 0.33 |
| 41 | 50+ | 4 | 106 | 6 | 0 | 2 | 0.30 | 0.34 | 0.31 |
| 42 | 6 | 86 | 67+ | 8 | 0 | 1 | 0.40 | 0.22 | 0.23 |
| 43 | 122 | 1 | 41+ | 3 | 1 | 0 | 0.24 | -0.09 | -0.19 |
| 44 | 68+ | 7 | 83 | 9 | 0 | 1 | 0.40 | 0.21 | 0.15 |
| 45 | 6 | 57+ | 95 | 9 | 0 | 1 | 0.34 | 0.07 | 0.10 |

+ - Indicates Correct Answer
** - Indicates Everyone Given Credit
* - Indicates Question Thrown Out

Appendix C (continued)

GATER-K AND GATER-P SUBTEST RESULTS

| Variable* | N | Mean | Std. Dev. | Sum | Minimum | Maximum |
|---|---|---|---|---|---|---|
| TK1 | 144 | 3.65277778 | 1.66963605 | 526.0000000 | 0 | 8.00000000 |
| TK2 | 144 | 3.73611111 | 1.54189109 | 538.0000000 | 0 | 8.00000000 |
| TK3 | 144 | 6.42361111 | 1.89434145 | 925.0000000 | 1.00000000 | 10.00000000 |
| TK4 | 144 | 5.24694444 | 2.01652796 | 757.0000000 | 0 | 9.00000000 |
| TK5 | 144 | 5.86805556 | 1.67351449 | 845.0000000 | 0 | 10.00000000 |
| TK6 | 144 | 5.09722222 | 1.87482193 | 734.0000000 | 0 | 10.00000000 |
| TK7 | 144 | 4.55555556 | 2.17029461 | 656.0000000 | 1.00000000 | 9.00000000 |
| TK8 | 144 | 6.13194444 | 2.38657823 | 883.0000000 | 1.00000000 | 10.00000000 |
| TK9 | 144 | 5.54166667 | 1.82398549 | 798.0000000 | 0 | 9.00000000 |
| TK10 | 144 | 4.13888889 | 1.65825383 | 596.0000000 | 0 | 8.00000000 |
| TP1 | 144 | 2.23611111 | 1.17065585 | 322.0000000 | 0 | 4.00000000 |
| TP2 | 144 | 1.15972222 | 0.90579482 | 167.0000000 | 0 | 3.00000000 |
| TP3 | 144 | 1.70138889 | 1.09083827 | 245.0000000 | 0 | 4.00000000 |
| TP4 | 144 | 2.97222222 | 1.29520063 | 428.0000000 | 0 | 5.00000000 |
| TP5 | 144 | 4.27777778 | 1.04743740 | 616.0000000 | 0 | 5.00000000 |
| TP6 | 144 | 4.06250000 | 1.18391758 | 585.0000000 | 1.00000000 | 5.00000000 |
| TP7 | 144 | 2.20833333 | 1.28397874 | 318.0000000 | 0 | 5.00000000 |
| TP8 | 144 | 2.75694444 | 1.39552997 | 397.0000000 | 0 | 5.00000000 |
| TP9 | 144 | 2.97916667 | 1.65342937 | 429.0000000 | 0 | 3.00000000 |
| TP10 | 144 | 1.38194444 | 0.97703033 | 199.0000000 | 0 | 3.00000000 |

*TK1-10 indicates subtest in the knowledge domain.
 TP1-10 indicates subtest in the performance domain.

Appendix C (continued)

GATER-K AND GATER-P  (n = 144)
SUBTEST INTERCORRELATION MATRIX

KNOWLEDGE DOMAIN SUBTESTS

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -0.00785 | 0.09675 | -0.95488 | -0.03180 | 0.06599 | 0.09461 | 0.04985 | 0.06636 | -0.02756 | -0.02061 |
| 2 | -0.04168 | 0.10049 | 0.06625 | 0.15731 | 0.12010 | 0.11845 | 0.11107 | 0.03224 | 0.08271 | 0.14808 |
| 3 | 0.05402 | 0.08587 | 0.10902 | -0.00938 | 0.04722 | -0.09171 | 0.16213 | -0.00356 | -0.11847 | -0.03490 |
| 4 | 0.15073 | 0.11186 | 0.10744 | 0.00007 | 0.19187 | 0.07600 | 0.08016 | 0.17539 | 0.03897 | 0.15809 |
| 5 | 0.23148 | 0.21457 | 0.31034 | 0.13151 | 0.20457 | 0.10723 | 0.19312 | 0.21463 | 0.17325 | 0.23530 |
| 6 | 0.09596 | 0.29258 | 0.32174 | 0.10746 | 0.26184 | 0.19258 | 0.29665 | 0.19753 | 0.23356 | 0.12734 |
| 7 | 0.19382 | 0.10567 | 0.09572 | 0.13583 | 0.06495 | 0.20650 | 0.30951 | 0.25112 | 0.15452 | 0.07499 |
| 8 | 0.02355 | 0.19423 | 0.20587 | 0.13666 | 0.08498 | 0.20154 | 0.19497 | 0.28055 | 0.14549 | 0.03282 |
| 9 | 0.17468 | 0.08286 | 0.31987 | 0.08341 | 0.21887 | 0.13601 | 0.33649 | 0.12121 | 0.08724 | 0.12904 |
| 10 | 0.04822 | 0.19917 | 0.03242 | 0.09042 | 0.08699 | 0.03680 | 0.15594 | 0.07933 | 0.11020 | -0.00307 |

Rows 1–6: PERFORMANCE SUBTESTS
Rows 7–10: DOMAIN SUBTESTS

Appendix C (continued)

NOTE: Pretest scores for Subjects 1-2 appear at the end of this Appendix. A 10 in the Training Courses column indicates subjects with reading certification. An X in the Years of Reading Experience column indicates missing data on this variable.

| Subject | Training Courses | Years Reading Experience | Knowledge Domain Subtest Scores | | | | | | | | | | Total | Performance Domain Subtest Scores | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | g | f | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 1 | 1 | 0 | 4 | 5 | 9 | 5 | 9 | 3 | 4 | 5 | 7 | 4 | 55 | 0 | 1 | 3 | 2 | 5 | 5 | 3 | 5 | 3 | 1 | 28 |
| 2 | 1 | 0 | 5 | 4 | 9 | 7 | 7 | 7 | 9 | 6 | 4 | 7 | 65 | 1 | 2 | 2 | 1 | 4 | 5 | 3 | 1 | 2 | 0 | 21 |
| 3 | 1 | 0 | 4 | 4 | 8 | 9 | 9 | 8 | 8 | 9 | 6 | 4 | 65 | 1 | 2 | 2 | 2 | 4 | 4 | 3 | 3 | 6 | 2 | 28 |
| 4 | 1 | X | 5 | 2 | 6 | 7 | 9 | 7 | 7 | 9 | 6 | 6 | 59 | 4 | 1 | 4 | 4 | 5 | 4 | 2 | 1 | 3 | 2 | 27 |
| 5 | 1 | 0 | 4 | 8 | 8 | 7 | 5 | 8 | 6 | 8 | 6 | 4 | 60 | 3 | 1 | 1 | 3 | 5 | 4 | 1 | 5 | 3 | 2 | 22 |
| 6 | 1 | 0 | 3 | 7 | 8 | 8 | 8 | 6 | 8 | 6 | 6 | 5 | 63 | 1 | 1 | 3 | 3 | 5 | 5 | 4 | 3 | 3 | 2 | 29 |
| 7 | 1 | 0 | 5 | 4 | 6 | 6 | 5 | 8 | 6 | 7 | 6 | 3 | 59 | 1 | 2 | 3 | 4 | 2 | 5 | 1 | 5 | 3 | 2 | 28 |
| 8 | 1 | 0 | 5 | 6 | 7 | 6 | 4 | 8 | 8 | 9 | 4 | 4 | 55 | 3 | 0 | 1 | 3 | 5 | 2 | 2 | 5 | 4 | 0 | 23 |
| 9 | 1 | 0 | 6 | 2 | 6 | 5 | 5 | 3 | 8 | 7 | 7 | 4 | 43 | 3 | 0 | 1 | 2 | 3 | 5 | 1 | 2 | 1 | 2 | 20 |
| 10 | 1 | 0 | 3 | 7 | 8 | 4 | 8 | 7 | 3 | 4 | 7 | 5 | 66 | 0 | 1 | 0 | 1 | 5 | 2 | 2 | 0 | 1 | 2 | 22 |
| 11 | 1 | 0 | 6 | 4 | 4 | 3 | 4 | 2 | 7 | 7 | 7 | 3 | 36 | 0 | 0 | 2 | 2 | 4 | 1 | 1 | 1 | 1 | 1 | 13 |
| 12 | 1 | 0 | 3 | 4 | 8 | 4 | 6 | 7 | 2 | 3 | 7 | 5 | 58 | 3 | 1 | 1 | 5 | 5 | 4 | 2 | 4 | 5 | 2 | 26 |
| 13 | 1 | 0 | 6 | 4 | 6 | 7 | 6 | 7 | 7 | 8 | 4 | 3 | 50 | 2 | 1 | 4 | 5 | 5 | 5 | 3 | 2 | 3 | 3 | 30 |
| 14 | 1 | 0 | 5 | 4 | 8 | 8 | 6 | 5 | 7 | 7 | 6 | 6 | 57 | 3 | 0 | 3 | 2 | 5 | 3 | 4 | 3 | 3 | 1 | 30 |
| 15 | 1 | 0 | 6 | 3 | 7 | 3 | 7 | 6 | 6 | 4 | 7 | 0 | 64 | 0 | 2 | 2 | 4 | 4 | 5 | 1 | 4 | 1 | 2 | 31 |
| 16 | 1 | 0 | 3 | 7 | 7 | 4 | 6 | 7 | 7 | 6 | 6 | 6 | 52 | 2 | 0 | 2 | 0 | 0 | 6 | 3 | 1 | 4 | 2 | 6 |
| 17 | 1 | 0 | 7 | 4 | 6 | 5 | 5 | 4 | 4 | 7 | 6 | 4 | 50 | 3 | 0 | 2 | 4 | 4 | 2 | 3 | 0 | 1 | 1 | 22 |
| 18 | 1 | 0 | 6 | 5 | 6 | 7 | 7 | 3 | 3 | 6 | 3 | 2 | 40 | 3 | 1 | 3 | 2 | 3 | 3 | 2 | 0 | 4 | 2 | 21 |
| 19 | 1 | 0 | 6 | 1 | 5 | 8 | 5 | 6 | 5 | 3 | 6 | 4 | 49 | 3 | 1 | 3 | 2 | 3 | 3 | 3 | 2 | 5 | 3 | 31 |
| 20 | 1 | 0 | 6 | 3 | 8 | 9 | 7 | 4 | 4 | 4 | 0 | 6 | 63 | 2 | 2 | 3 | 3 | 5 | 5 | 4 | 5 | 1 | 1 | 28 |
| 21 | 1 | 0 | 5 | 6 | 9 | 7 | 6 | 4 | 6 | 9 | 7 | 4 | 69 | 1 | 1 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 2 | 31 |
| 22 | 1 | 0 | 6 | 5 | 10 | 7 | 6 | 5 | 7 | 9 | 6 | 6 | 66 | 2 | 2 | 3 | 2 | 5 | 5 | 1 | 4 | 3 | 3 | 30 |
| 23 | 1 | 0 | 7 | 4 | 9 | 7 | 8 | 5 | 7 | 10 | 7 | 6 | 70 | 1 | 1 | 1 | 5 | 5 | 3 | 4 | 4 | 5 | 1 | 30 |

Appendix C (continued)

| | | | Knowledge Domain Subtest Scores | | | | | | | | | | | Performance Domain Subtest Scores | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | Training Course | Years Reg. Exp. | f | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
| 24 | 10 | 6 | | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 26 | 1 | 2 | 2 | 4 | 5 | 5 | 4 | 4 | 2 | 1 | 29 |
| 25 | 10 | 4 | | 1 | 1 | 5 | 1 | 4 | 3 | 2 | 3 | 1 | 1 | 22 | 3 | 0 | 4 | 5 | 5 | 5 | 4 | 3 | 4 | 1 | 34 |
| 26 | 10 | 3 | | 2 | 1 | 5 | 2 | 3 | 1 | 2 | 3 | 3 | 2 | 24 | 4 | 2 | 1 | 3 | 4 | 4 | 4 | 2 | 4 | 1 | 30 |
| 27 | 10 | 8 | | 1 | 2 | 5 | 2 | 5 | 2 | 4 | 3 | 0 | 3 | 27 | 3 | 2 | 2 | 5 | 5 | 5 | 4 | 3 | 2 | 1 | 33 |
| 28 | 10 | 8 | | 1 | 2 | 5 | 3 | 3 | 3 | 3 | 6 | 3 | 1 | 30 | 3 | 2 | 3 | 3 | 4 | 5 | 5 | 5 | 5 | 1 | 35 |
| 29 | 10 | 4 | | 1 | 2 | 6 | 2 | 4 | 1 | 2 | 3 | 1 | 0 | 23 | 4 | 1 | 1 | 5 | 4 | 2 | 3 | 0 | 5 | 1 | 26 |
| 30 | 10 | 3 | | 1 | 2 | 7 | 0 | 1 | 2 | 2 | 1 | 1 | 3 | 20 | 4 | 2 | 3 | 4 | 5 | 4 | 0 | 2 | 5 | 0 | 29 |
| 31 | 10 | 4 | | 4 | 2 | 7 | 0 | 3 | 3 | 1 | 3 | 1 | 4 | 28 | 2 | 1 | 4 | 2 | 5 | 5 | 2 | 5 | 5 | 3 | 38 |
| 32 | 10 | 4 | | 3 | 2 | 4 | 1 | 4 | 1 | 6 | 2 | 2 | 2 | 23 | 4 | 2 | 2 | 4 | 5 | 5 | 5 | 3 | 3 | 2 | 27 |
| 33 | 6 | 2 | | 2 | 3 | 6 | 6 | 5 | 2 | 6 | 8 | 7 | 7 | 59 | 3 | 1 | 1 | 5 | 5 | 5 | 3 | 4 | 3 | 2 | 29 |
| 34 | 3 | 2 | | 5 | 5 | 8 | 5 | 5 | 6 | 5 | 8 | 5 | 5 | 55 | 2 | 1 | 2 | 1 | 4 | 5 | 3 | 3 | 3 | 3 | 32 |
| 35 | 10 | 9 | | 4 | 6 | 9 | 5 | 8 | 9 | 3 | 9 | 7 | 4 | 68 | 2 | 2 | 2 | 2 | 5 | 4 | 5 | 5 | 5 | 2 | 24 |
| 36 | 4 | 5 | | 3 | 6 | 8 | 5 | 5 | 6 | 5 | 4 | 6 | 3 | 53 | 1 | 0 | 0 | 3 | 5 | 4 | 1 | 3 | 0 | 1 | 18 |
| 37 | 3 | 9 | | 1 | 4 | 7 | 7 | 4 | 5 | 5 | 7 | 5 | 2 | 42 | 1 | 1 | 1 | 5 | 3 | 5 | 5 | 2 | 3 | 1 | 22 |
| 38 | 3 | 7 | | 3 | 3 | 6 | 3 | 7 | 7 | 2 | 5 | 6 | 3 | 50 | 1 | 2 | 2 | 0 | 5 | 3 | 4 | 4 | 1 | 1 | 17 |
| 39 | 4 | 9 | | 3 | 0 | 7 | 8 | 6 | 5 | 5 | 1 | 5 | 3 | 36 | 3 | 1 | 2 | 1 | 3 | 5 | 0 | 0 | 2 | 2 | 29 |
| 40 | 9 | 0 | | 2 | 2 | 5 | 3 | 6 | 5 | 7 | 8 | 5 | 3 | 51 | 3 | 3 | 3 | 2 | 5 | 5 | 3 | 4 | 4 | 2 | 29 |
| 41 | 2 | 0 | | 2 | 6 | 7 | 7 | 4 | 7 | 5 | 8 | 6 | 4 | 49 | 4 | 2 | 1 | 5 | 5 | 5 | 2 | 5 | 4 | 1 | 20 |
| 42 | 2 | 9 | | 3 | 5 | 7 | 4 | 7 | 5 | 7 | 2 | 6 | 1 | 51 | 2 | 2 | 2 | 4 | 4 | 5 | 3 | 4 | 4 | 2 | 29 |
| 43 | 2 | 5 | | 8 | 5 | 7 | 9 | 6 | 10 | 5 | 7 | 7 | 2 | 52 | 2 | 2 | 2 | 4 | 5 | 5 | 3 | 2 | 4 | 1 | 34 |
| 44 | 10 | 9 | | 3 | 3 | 6 | 6 | 8 | 2 | 5 | 10 | 6 | 5 | 76 | 2 | 2 | 2 | 2 | 5 | 5 | 3 | 3 | 5 | 2 | 33 |
| 45 | 2 | 9 | | 5 | 3 | 9 | 9 | 9 | 3 | 2 | 10 | 5 | 4 | 61 | 2 | 1 | 1 | 2 | 3 | 5 | 3 | 3 | 2 | 1 | 31 |
| 46 | 10 | 9 | | 2 | 3 | 6 | 7 | 5 | 3 | 3 | 7 | 3 | 3 | 46 | 1 | 1 | 1 | 5 | 5 | 5 | 1 | 1 | 0 | 1 | 21 |
| 47 | 2 | 0 | | 5 | 3 | 7 | 7 | 6 | 0 | 0 | 6 | 6 | 6 | 54 | 1 | 0 | 1 | 2 | 5 | 3 | 1 | 0 | 1 | 1 | 15 |

Appendix C (continued)

|  |  |  | Knowledge Domain Subtest Scores | | | | | | | | | | | Performance Domain Subtest Scores | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | g | f. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
| 48 | 2 | 0 | 3 | 4 | 9 | 4 | 5 | 7 | 5 | 4 | 6 | 2 | 51 | 2 | 0 | 3 | 3 | 4 | 5 | 2 | 3 | 5 | 2 | 29 |
| 49 | 2 | 0 | 3 | 3 | 9 | 5 | 9 | 5 | 8 | 9 | 5 | 4 | 60 | 2 | 1 | 1 | 4 | 4 | 5 | 3 | 4 | 4 | 1 | 29 |
| 50 | 2 | 0 | 3 | 3 | 9 | 4 | 7 | 5 | 4 | 4 | 3 | 5 | 54 | 2 | 1 | 1 | 5 | 5 | 4 | 2 | 4 | 5 | 2 | 31 |
| 51 | 2 | 0 | 3 | 5 | 9 | 4 | 9 | 7 | 6 | 10 | 5 | 4 | 59 | 2 | 1 | 2 | 5 | 4 | 5 | 1 | 4 | 5 | 1 | 27 |
| 52 | 2 | x | 2 | 5 | 9 | 3 | 5 | 9 | 6 | 7 | 6 | 6 | 54 | 1 | 1 | 3 | 3 | 4 | 4 | 2 | 3 | 4 | 1 | 26 |
| 53 | 2 | x | 3 | 5 | 8 | 7 | 6 | 5 | 7 | 7 | 5 | 3 | 59 | 2 | 0 | 2 | 2 | 5 | 5 | 3 | 5 | 5 | 0 | 30 |
| 54 | 2 | x | 3 | 3 | 9 | 2 | 6 | 6 | 4 | 10 | 5 | 4 | 51 | 2 | 0 | 1 | 4 | 4 | 3 | 1 | 2 | 1 | 0 | 18 |
| 55 | 2 | 0 | 3 | 4 | 8 | 5 | 6 | 6 | 4 | 8 | 6 | 4 | 47 | 3 | 1 | 3 | 5 | 5 | 5 | 2 | 3 | 3 | 2 | 30 |
| 56 | 2 | 0 | 5 | 3 | 9 | 7 | 5 | 5 | 6 | 3 | 8 | 2 | 58 | 3 | 0 | 3 | 3 | 5 | 5 | 3 | 4 | 3 | 2 | 31 |
| 57 | 2 | x | 3 | 3 | 6 | 6 | 3 | 5 | 4 | 6 | 4 | 5 | 42 | 0 | 1 | 2 | 3 | 4 | 4 | 0 | 2 | 4 | 1 | 22 |
| 58 | 2 | 0 | 4 | 3 | 7 | 5 | 5 | 3 | 6 | 4 | 6 | 5 | 48 | 4 | 1 | 1 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 24 |
| 59 | 2 | 0 | 3 | 4 | 9 | 6 | 7 | 5 | 4 | 5 | 4 | 2 | 52 | 3 | 0 | 3 | 1 | 5 | 4 | 2 | 4 | 0 | 0 | 23 |
| 60 | 3 | 1 | 2 | 3 | 7 | 5 | 8 | 7 | 5 | 9 | 5 | 4 | 52 | 1 | 0 | 1 | 3 | 4 | 2 | 0 | 2 | 4 | 2 | 22 |
| 61 | 2 | 0 | 3 | 5 | 6 | 6 | 8 | 8 | 4 | 7 | 5 | 5 | 58 | 0 | 0 | 2 | 0 | 5 | 4 | 5 | 0 | 0 | 0 | 10 |
| 62 | 1 | 0 | 6 | 3 | 3 | 3 | 5 | 8 | 7 | 4 | 7 | 4 | 39 | 1 | 2 | 1 | 2 | 0 | 5 | 1 | 3 | 4 | 3 | 30 |
| 63 | 3 | 0 | 4 | 6 | 6 | 0 | 7 | 5 | 5 | 8 | 5 | 1 | 59 | 3 | 1 | 0 | 4 | 4 | 2 | 4 | 3 | 0 | 1 | 17 |
| 64 | 2 | 0 | 4 | 3 | 5 | 8 | 2 | 7 | 5 | 6 | 6 | 6 | 35 | 1 | 1 | 3 | 4 | 2 | 4 | 2 | 4 | 4 | 1 | 32 |
| 65 | 10 | 0 | 3 | 2 | 6 | 5 | 6 | 2 | 3 | 6 | 6 | 1 | 37 | 3 | 0 | 0 | 1 | 5 | 2 | 0 | 2 | 3 | 3 | 14 |
| 66 | 10 | 0 | 4 | 4 | 5 | 1 | 3 | 6 | 2 | 3 | 6 | 6 | 46 | 0 | 0 | 1 | 2 | 5 | 5 | 1 | 3 | 3 | 0 | 25 |
| 67 | 10 | 0 | 0 | 5 | 7 | 7 | 6 | 6 | 2 | 4 | 2 | 5 | 34 | 3 | 1 | 0 | 3 | 4 | 2 | 2 | 0 | 4 | 2 | 16 |
| 68 | 10 | 9 | 5 | 4 | 3 | 4 | 5 | 4 | 3 | 4 | 4 | 2 | 53 | 1 | 0 | 3 | 3 | 5 | 5 | 5 | 3 | 1 | 2 | 23 |
| 69 | 10 | 3 | 7 | 4 | 7 | 5 | 6 | 6 | 7 | 10 | 9 | 5 | 66 | 1 | 1 | 3 | 4 | 5 | 5 | 2 | 3 | 5 | 3 | 34 |
| 70 | 10 | 6 | 5 | 4 | 6 | 8 | 7 | 7 | 5 | 9 | 6 | 4 | 58 | 3 | 0 | 1 | 4 | 5 | 5 | 3 | 2 | 4 | 2 | 27 |
| 71 | 8 | 9 | 5 | 4 | 6 | 8 | 7 | 7 | 5 | 7 | 6 | 4 | 58 | 3 | 2 | 1 | 3 | 5 | 4 | 3 | 3 | 3 | 1 | 29 |

Appendix C (continued)

| Subject | Trans. Courses f | Yrs. Read. Exp. | Knowledge Domain Subtest Scores | | | | | | | | | | | Performance Domain Subtest Scores | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
| 72 | 10 | 5 | 5 | 8 | 8 | 6 | 6 | 7 | 9 | 10 | 6 | 5 | 67 | 3 | 1 | 3 | 3 | 5 | 4 | 4 | 4 | 5 | 2 | 34 |
| 73 | 10 | 5 | 5 | 7 | 5 | 4 | 5 | 7 | 6 | 9 | 9 | 4 | 62 | 2 | 1 | 2 | 3 | 5 | 4 | 4 | 3 | 3 | 2 | 29 |
| 74 | 7 | 6 | 8 | 8 | 8 | 6 | 6 | 9 | 7 | 10 | 8 | 2 | 65 | 3 | 0 | 1 | 2 | 5 | 4 | 3 | 3 | 3 | 2 | 28 |
| 75 | 10 | 6 | 6 | 8 | 8 | 8 | 7 | 9 | 8 | 8 | 8 | 5 | 74 | 4 | 2 | 1 | 5 | 5 | 5 | 4 | 2 | 4 | 3 | 36 |
| 76 | 4 | 2 | 6 | 6 | 6 | 4 | 6 | 8 | 7 | 8 | 8 | 6 | 62 | 3 | 0 | 2 | 5 | 5 | 5 | 5 | 4 | 5 | 1 | 36 |
| 77 | 10 | 3 | 4 | 5 | 5 | 7 | 7 | 5 | 0 | 5 | 5 | 5 | 46 | 2 | 2 | 1 | 4 | 5 | 3 | 2 | 1 | 2 | — | 22 |
| 78 | 10 | 4 | 5 | 5 | 7 | 9 | 8 | 6 | 5 | 8 | 9 | 4 | 65 | 4 | 0 | 1 | 5 | 5 | 5 | 3 | 1 | 5 | 1 | 30 |
| 79 | 10 | 5 | 8 | 7 | 10 | 5 | 10 | 9 | 4 | 8 | 9 | 5 | 72 | 2 | 2 | 4 | 3 | 4 | 3 | 3 | 2 | 5 | 1 | 33 |
| 80 | 0 | 1 | 5 | 5 | 6 | 5 | 8 | 8 | 7 | 8 | 8 | 5 | 58 | 2 | 1 | 0 | 4 | 4 | 2 | 1 | 3 | 0 | 4 | 21 |
| 81 | 3 | 9 | 4 | 2 | 8 | 4 | 5 | 6 | 4 | 6 | 5 | 7 | 55 | 1 | 1 | 3 | 3 | 5 | 2 | 2 | 1 | 4 | 0 | 30 |
| 82 | 1 | 0 | 2 | 1 | 5 | 3 | 4 | 6 | 7 | 6 | 5 | 5 | 39 | 3 | 1 | 0 | 3 | 4 | 2 | 1 | 1 | 5 | 0 | 23 |
| 83 | 1 | 0 | 6 | 6 | 2 | 2 | 2 | 3 | 3 | 8 | 5 | 3 | 41 | 2 | 0 | 2 | 2 | 3 | 2 | 2 | 4 | 4 | 1 | 25 |
| 84 | 3 | 8 | 6 | 5 | 8 | 6 | 6 | 8 | 4 | 6 | 5 | 2 | 62 | 4 | 2 | 2 | 3 | 4 | 3 | 4 | 3 | 5 | 1 | 29 |
| 85 | 1 | 0 | 5 | 3 | 7 | 4 | 7 | 9 | 5 | 6 | 6 | 5 | 55 | 3 | 1 | 2 | 3 | 4 | 2 | 2 | 3 | 4 | 2 | 27 |
| 86 | 3 | 0 | 4 | 2 | 7 | 5 | 6 | 8 | 7 | 8 | 5 | 5 | 57 | 4 | 0 | 1 | 4 | 4 | 2 | 2 | 3 | 4 | 3 | 25 |
| 87 | 10 | 3 | 2 | 2 | 8 | 5 | 8 | 8 | 6 | 10 | 7 | 6 | 62 | 2 | 0 | 0 | 3 | 5 | 2 | 3 | 3 | 0 | 1 | 27 |
| 88 | 10 | 9 | 5 | 6 | 4 | 4 | 8 | 6 | 6 | 6 | 8 | 5 | 68 | 3 | 2 | 1 | 4 | 5 | 3 | 4 | 5 | 5 | 2 | 34 |
| 89 | 10 | 7 | 1 | 4 | 8 | 7 | 5 | 6 | 4 | 5 | 6 | 4 | 51 | 4 | 3 | 1 | 2 | 4 | 2 | 2 | 3 | 4 | 1 | 25 |
| 90 | 10 | 0 | 5 | 4 | 6 | 5 | 7 | 8 | 4 | 6 | 4 | 4 | 59 | 2 | 1 | 3 | 4 | 4 | 4 | 1 | 2 | 5 | 0 | 34 |
| 91 | 10 | 8 | 3 | 2 | 6 | 4 | 5 | 5 | 2 | 9 | 6 | 5 | 48 | 1 | 0 | 0 | 4 | 2 | 1 | 1 | 2 | 1 | 2 | 23 |
| 92 | 0 | 3 | 1 | 2 | 6 | 6 | 5 | 7 | 3 | 4 | 8 | 4 | 43 | 3 | 2 | 2 | 1 | 5 | 2 | 2 | 4 | 4 | 0 | 24 |
| 93 | 2 | 0 | 3 | 3 | 8 | 8 | 5 | 5 | 4 | 5 | 6 | 4 | 47 | 2 | 2 | 3 | 1 | 4 | 3 | 3 | 5 | 5 | 1 | 28 |
| 94 | 8 | 2 | 1 | 1 | 8 | 6 | 5 | 5 | 6 | 4 | 8 | 5 | 49 | 2 | 2 | 1 | 1 | 4 | 3 | 1 | 0 | 7 | 0 | 23 |
| 95 | 4 | 9 | 3 | 3 | 6 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 48 | 2 | 3 | 0 | 0 | 5 | 4 | 3 | 0 | 1 | 1 | 19 |

Appendix C (continued)

The leftmost header columns (printed vertically) read:

```
T C   Y R
r o   e d
a u   r  a g.
n s   r  s E
n   i e    x
g          op.
              f
```

## Knowledge Domain Subtest Scores

| Subject | g | f | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96 | 10 | 2 | 3 | 4 | 7 | 6 | 7 | 3 | 6 | 5 | 6 | 6 | 53 |
| 97 | 2 | 7 | 3 | 1 | 7 | 5 | 5 | 6 | 4 | 8 | 7 | 4 | 50 |
| 98 | 1 | 1 | 3 | 7 | 7 | 6 | 6 | 8 | 8 | 9 | 7 | 6 | 67 |
| 99 | 0 | 0 | 4 | 2 | 2 | 4 | 5 | 4 | 1 | 2 | 0 | 0 | 24 |
| 100 | 3 | 9 | 4 | 5 | 4 | 5 | 5 | 7 | 1 | 6 | 6 | 4 | 47 |
| 101 | 2 | 9 | 1 | 3 | 4 | 4 | 3 | 6 | 2 | 7 | 7 | 2 | 39 |
| 102 | 9 | 9 | 3 | 1 | 2 | 5 | 3 | 2 | 2 | 6 | 2 | 7 | 27 |
| 103 | 6 | 0 | 3 | 3 | 7 | 2 | 7 | 4 | 3 | 9 | 5 | 6 | 49 |
| 104 | 1 | 0 | 2 | 4 | 4 | 9 | 7 | 5 | 6 | 5 | 6 | 4 | 50 |
| 105 | 5 | 9 | 3 | 3 | 5 | 5 | 8 | 7 | 5 | 6 | 6 | 2 | 52 |
| 106 | 2 | 0 | 4 | 5 | 3 | 5 | 4 | 5 | 7 | 8 | 6 | 4 | 51 |
| 107 | 3 | 9 | 5 | 5 | 5 | 6 | 4 | 7 | 2 | 6 | 5 | 4 | 52 |
| 108 | 10 | 1 | 4 | 3 | 5 | 6 | 4 | 4 | 3 | 5 | 6 | 6 | 45 |
| 109 | 2 | 8 | 4 | 4 | 7 | 6 | 3 | 6 | 2 | 6 | 2 | 2 | 53 |
| 110 | 5 | 4 | 1 | 4 | 3 | 5 | 3 | 5 | 3 | 4 | 3 | 3 | 31 |
| 111 | 3 | 0 | 1 | 2 | 6 | 5 | 5 | 4 | 2 | 9 | 5 | 3 | 45 |
| 112 | 2 | 9 | 5 | 3 | 5 | 4 | 9 | 6 | 2 | 6 | 5 | 1 | 37 |
| 113 | 5 | 2 | 4 | 2 | 6 | 7 | 6 | 5 | 5 | 5 | 3 | 5 | 47 |
| 114 | 5 | 8 | 3 | 4 | 5 | 4 | 6 | 6 | 4 | 4 | 9 | 4 | 35 |
| 115 | 3 | 9 | 6 | 4 | 6 | 5 | 4 | 6 | 1 | 9 | 6 | 6 | 54 |
| 116 | 6 | 0 | 3 | 8 | 7 | 6 | 6 | 6 | 3 | 8 | 6 | 6 | 49 |
| 117 | 1 | 0 | 2 | 5 | 5 | 6 | 6 | 6 | 8 | 5 | 6 | 6 | 60 |
| 118 | 2 | 0 | 3 | 4 | 4 | 6 | 5 | 5 | 8 | 8 | 5 | 9 | 59 |
| 119 | 2 |  | 2 | 4 | 6 | 5 | 6 | 5 | 3 | 3 | 5 | 3 | 47 |

## Performance Domain Subtest Scores

| Subject | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 96 | 2 | 3 | 0 | 3 | 5 | 5 | 2 | 4 | 4 | 1 | 29 |
| 97 | 1 | 2 | 0 | 4 | 5 | 5 | 3 | 1 | 1 | 1 | 22 |
| 98 | 3 | 1 | 1 | 4 | 5 | 4 | 3 | 4 | 3 | 0 | 29 |
| 99 | 3 | 0 | 0 | 0 | 3 | 2 | 2 | 0 | 1 | 1 | 11 |
| 100 | 3 | 0 | 3 | 3 | 5 | 5 | 2 | 5 | 1 | 0 | 30 |
| 101 | 2 | 1 | 2 | 0 | 3 | 3 | 0 | 2 | 0 | 3 | 16 |
| 102 | 3 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 7 |
| 103 | 4 | 1 | 0 | 0 | 3 | 1 | 1 | 1 | 0 | 1 | 14 |
| 104 | 2 | 0 | 2 | 3 | 5 | 5 | 2 | 3 | 3 | 1 | 29 |
| 105 | 3 | 3 | 1 | 4 | 3 | 5 | 4 | 5 | 5 | 2 | 33 |
| 106 | 4 | 0 | 1 | 4 | 4 | 2 | 3 | 3 | 5 | 1 | 25 |
| 107 | 3 | 2 | 4 | 3 | 5 | 4 | 3 | 4 | 4 | 0 | 34 |
| 108 | 4 | 0 | 1 | 2 | 4 | 4 | 1 | 3 | 1 | 1 | 19 |
| 109 | 3 | 3 | 0 | 4 | 5 | 5 | 0 | 1 | 5 | 0 | 33 |
| 110 | 0 | 0 | 2 | 3 | 3 | 1 | 1 | 3 | 2 | 3 | 17 |
| 111 | 0 | 0 | 2 | 3 | 3 | 5 | 1 | 3 | 1 | 2 | 20 |
| 112 | 4 | 2 | 1 | 2 | 5 | 3 | 1 | 3 | 0 | 2 | 22 |
| 113 | 2 | 2 | 1 | 2 | 5 | 3 | 0 | 3 | 1 | 1 | 20 |
| 114 | 1 | 0 | 3 | 2 | 2 | 2 | 4 | 4 | 0 | 1 | 16 |
| 115 | 2 | 0 | 0 | 4 | 5 | 5 | 3 | 3 | 4 | 2 | 29 |
| 116 | 3 | 2 | 0 | 4 | 5 | 4 | 2 | 3 | 3 | 1 | 28 |
| 117 | 2 | 3 | 2 | 3 | 5 | 5 | 2 | 2 | 3 | 1 | 29 |
| 118 | 4 | 2 | 2 | 3 | 5 | 4 | 0 | 2 | 3 | 2 | 29 |
| 119 | 1 | 3 | 4 | 3 | 4 | 5 |  | 3 | 4 | 2 | 29 |

Appendix C (continued)

| Subject | Training g | f | Knowledge Domain Subtest Scores | | | | | | | | | | Total | Performance Domain Subtest Scores | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 120 | 4 | 9 | 3 | 4 | 8 | 5 | 6 | 7 | 9 | 9 | 6 | 7 | 64 | 3 | 2 | 2 | 3 | 5 | 4 | 3 | 4 | 5 | 2 | 33 |
| 121 | 3 | 0 | 3 | 3 | 4 | 3 | 5 | 4 | 2 | 4 | 5 | 2 | 35 | 2 | 1 | 2 | 2 | 3 | 3 | 0 | 4 | 1 | 1 | 19 |
| 122 | 9 | 5 | 3 | 3 | 4 | 6 | 4 | 2 | 0 | 4 | 6 | 1 | 35 | 2 | 1 | 2 | 4 | 3 | 2 | 1 | 1 | 0 | 3 | 18 |
| 123 | 4 | 5 | 4 | 5 | 2 | 7 | 5 | 5 | 5 | 0 | 6 | 5 | 48 | 3 | 1 | 3 | 2 | 5 | 5 | 2 | 2 | 5 | 2 | 30 |
| 124 | 2 | 0 | 4 | 1 | 8 | 4 | 5 | 6 | 6 | 3 | 4 | 4 | 42 | 0 | 1 | 2 | 2 | 4 | 3 | 2 | 3 | 1 | 0 | 18 |
| 125 | 1 | X | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 1 | 7 | 6 | 28 | 1 | 0 | 1 | 1 | 3 | 5 | 3 | 0 | 0 | 3 | 13 |
| 126 | 2 | 7 | 3 | 4 | 3 | 4 | 5 | 3 | 6 | 6 | 6 | 2 | 56 | 4 | 0 | 2 | 3 | 5 | 5 | 0 | 1 | 5 | 1 | 32 |
| 127 | 3 | 0 | 5 | 2 | 7 | 4 | 4 | 7 | 5 | 7 | 8 | 7 | 47 | 0 | 1 | 3 | 0 | 4 | 5 | 4 | 4 | 4 | 0 | 16 |
| 128 | 2 | 2 | 2 | 2 | 5 | 5 | 6 | 5 | 3 | 8 | 6 | 6 | 55 | 3 | 3 | 3 | 2 | 5 | 5 | 2 | 0 | 0 | 3 | 30 |
| 129 | 1 | 0 | 4 | 3 | 5 | 7 | 8 | 5 | 4 | 0 | 7 | 6 | 41 | 1 | 1 | 0 | 1 | 3 | 3 | 3 | 4 | 4 | 1 | 21 |
| 130 | 1 | 0 | 2 | 3 | 7 | 6 | 4 | 3 | 4 | 0 | 6 | 4 | 50 | 1 | 3 | 2 | 4 | 3 | 5 | 3 | 1 | 0 | 0 | 20 |
| 131 | 3 | 3 | 2 | 4 | 5 | 8 | 6 | 3 | 3 | 6 | 8 | 6 | 57 | 2 | 1 | 1 | 2 | 4 | 3 | 2 | 2 | 4 | 2 | 28 |
| 132 | 3 | 0 | 2 | 3 | 7 | 6 | 6 | 5 | 6 | 8 | 5 | 6 | 60 | 3 | 3 | 2 | 4 | 5 | 4 | 0 | 4 | 5 | 2 | 28 |
| 133 | 4 | 1 | 1 | 5 | 10 | 6 | 7 | 3 | 2 | 6 | 5 | 3 | 46 | 2 | 2 | 2 | 3 | 3 | 5 | 0 | 1 | 3 | 1 | 23 |
| 134 | 0 | 0 | 2 | 4 | 7 | 4 | 6 | 5 | 2 | 7 | 7 | 5 | 51 | 4 | 2 | 3 | 3 | 4 | 5 | 2 | 2 | 0 | 0 | 27 |
| 135 | 0 | 0 | 4 | 3 | 6 | 6 | 8 | 7 | 4 | 8 | 4 | 4 | 53 | 2 | 1 | 0 | 3 | 5 | 2 | 3 | 0 | 0 | 2 | 21 |
| 136 | 0 | 0 | 3 | 6 | 9 | 5 | 5 | 3 | 4 | 6 | 7 | 8 | 43 | 3 | 0 | 1 | 5 | 4 | 5 | 1 | 3 | 5 | 1 | 23 |
| 137 | 0 | 0 | 4 | 4 | 7 | 7 | 6 | 4 | 1 | 4 | 7 | 5 | 55 | 2 | 1 | 0 | 4 | 4 | 3 | 1 | 2 | 4 | 0 | 27 |
| 138 | 2 | 4 | 3 | 3 | 9 | 7 | 7 | 6 | 3 | 7 | 6 | 6 | 52 | 3 | 2 | 2 | 2 | 3 | 5 | 3 | 2 | 5 | 0 | 27 |
| 139 | 2 | 3 | 3 | 4 | 9 | 7 | 7 | 7 | 2 | 7 | 7 | 5 | 55 | 4 | 2 | 2 | 3 | 5 | 5 | 1 | 4 | 1 | 3 | 27 |
| 140 | 4 | 9 | 3 | 5 | 5 | 9 | 6 | 3 | 4 | 7 | 5 | 3 | 63 | 3 | 2 | 0 | 2 | 5 | 4 | 1 | 3 | 3 | 2 | 29 |
| 141 | 0 | 0 | 2 | 6 | 7 | 4 | 7 | 4 | 4 | 3 | 4 | 7 | 45 | 3 | 1 | 2 | 3 | 5 | 5 | 1 | 2 | 4 | 0 | 26 |
| 142 | 0 | 0 | 3 | 3 | 6 | 5 | 7 | 7 | 1 | 1 | 6 | 4 | 41 | 2 | 2 | 1 | 4 | 5 | 5 | 1 | 3 | 4 | 1 | 25 |
| 143 | 3 | 0 | 2 | 4 | 6 | 7 | 7 | 4 | 3 | 6 | 3 | 4 | 50 | 1 | 2 | 1 | 4 | 5 | 5 | 1 | 3 | 4 | 0 | 27 |
| 144 | 2 | 0 | 4 | 3 | 6 | 2 | 7 | 3 | 2 | 5 | 8 | 6 | 42 | 2 | 2 | 1 | 4 | 5 | 5 | 1 | 3 | 4 | 0 | 25 |
| 145 | 0 | 0 | 1 | 1 | 6 | 1 | 2 | 2 | 2 | 2 | — | 4 | 25 | 2 | 3 | 2 | 4 | 4 | 4 | — | 1 | — | 0 | 22 |

Appendix C (continued)

NOTE: Pretest scores for 23 preservice students enrolled in a basic reading course whose results were utilized in the preliminary validity and reliability analysis summarized in Tables 2, 3, 4, 5, and 6. Subject numbers in this portion of Appendix C correspond to subject numbers 1–23 in the beginning portion of Appendix C.

| Subject | Trng Crs f | Yr Ed Age Sex Exp g | Knowledge Domain Subtest Scores |||||||||||| Performance Domain Subtest Scores ||||||||||||
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | K1 | K2 | K3 | K4 | K5 | K6 | K7 | K8 | K9 | K10 | Total | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | Total |
| 1 | 0 | 0 | 2 | 3 | 3 | 0 | 4 | 5 | 2 | 2 | 2 | 1 | 24 | 2 | 1 | 3 | 3 | 3 | 5 | 2 | 2 | 4 | 1 | 24 |
| 2 | 0 | 0 | 2 | 5 | 4 | 1 | 2 | 4 | 3 | 4 | 4 | 3 | 32 | 1 | 1 | 1 | 3 | 3 | 2 | 0 | 2 | 1 | 0 | 15 |
| 3 | 0 | 0 | 2 | 3 | 4 | 6 | 2 | 3 | 4 | 4 | 3 | 1 | 28 | 2 | 1 | 1 | 4 | 5 | 3 | 2 | 5 | 5 | 1 | 28 |
| 4 | 0 | 0 | 2 | 4 | 4 | 1 | 2 | 3 | 4 | 4 | 3 | 1 | 28 | 1 | 3 | 2 | 2 | 2 | 5 | 1 | 2 | 3 | 1 | 21 |
| 5 | 0 | 0 | 4 | 1 | 3 | 2 | 0 | 5 | 3 | 4 | 6 | 1 | 29 | 2 | 1 | 1 | 3 | 5 | 5 | 2 | 2 | 3 | 0 | 25 |
| 6 | 0 | 0 | 3 | 4 | 4 | 1 | 2 | 3 | 0 | 4 | 2 | 4 | 27 | 3 | 1 | 2 | 3 | 4 | 5 | 3 | 1 | 4 | 2 | 27 |
| 7 | 0 | 0 | 0 | 4 | 3 | 1 | 1 | 3 | 2 | 3 | 2 | 1 | 18 | 4 | 2 | 3 | 3 | 4 | 3 | 1 | 5 | 4 | 0 | 26 |
| 8 | 0 | 0 | 2 | 3 | 3 | 3 | 0 | 2 | 4 | 3 | 2 | 0 | 22 | 2 | 3 | 1 | 1 | 3 | 5 | 1 | 2 | 1 | 2 | 20 |
| 9 | 0 | 0 | 3 | 5 | 5 | 1 | 0 | 4 | 2 | 4 | 6 | 3 | 33 | 1 | 1 | 3 | 2 | 2 | 1 | 1 | 4 | 3 | 0 | 15 |
| 10 | 0 | 0 | 1 | 1 | 5 | 0 | 3 | 5 | 2 | 2 | 2 | 1 | 18 | 2 | 3 | 1 | 4 | 5 | 3 | 1 | 2 | 0 | 2 | 24 |
| 11 | 0 | 0 | 1 | 1 | 4 | 5 | 1 | 3 | 4 | 4 | 2 | 3 | 28 | 0 | 1 | 0 | 2 | 4 | 2 | 1 | 1 | 2 | 1 | 14 |
| 12 | 0 | 0 | 2 | 4 | 5 | 3 | 0 | 5 | 1 | 2 | 4 | 1 | 27 | 3 | 0 | 2 | 2 | 3 | 5 | 3 | 2 | 3 | 0 | 21 |
| 13 | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 5 | 1 | 3 | 0 | 0 | 17 | 1 | 2 | 1 | 3 | 4 | 5 | 3 | 1 | 5 | 2 | 24 |
| 14 | 0 | 0 | 2 | 3 | 6 | 2 | 0 | 2 | 3 | 2 | 1 | 1 | 22 | 1 | 1 | 1 | 2 | 5 | 3 | 3 | 2 | 3 | 0 | 25 |
| 15 | 0 | 0 | 2 | 3 | 3 | 1 | 1 | 4 | 4 | 4 | 3 | 2 | 27 | 1 | 1 | 1 | 4 | 4 | 2 | 1 | 3 | 5 | 1 | 26 |
| 16 | 0 | 0 | 3 | 1 | 2 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 22 | 2 | 1 | 1 | 2 | 5 | 3 | 0 | 1 | 3 | 0 | 18 |
| 17 | 0 | 0 | 2 | 4 | 4 | 1 | 4 | 3 | 4 | 4 | 1 | 0 | 25 | 2 | 1 | 1 | 1 | 4 | 2 | 0 | 3 | 3 | 2 | 19 |
| 18 | 0 | 0 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 3 | 22 | 2 | 1 | 1 | 2 | 4 | 2 | 0 | 1 | 1 | 0 | 14 |
| 19 | 0 | 0 | 2 | 4 | 3 | 4 | 0 | 3 | 2 | 2 | 2 | 2 | 24 | 2 | 2 | 2 | 5 | 5 | 3 | 2 | 2 | 5 | 2 | 20 |
| 20 | 0 | 0 | 2 | 1 | 4 | 1 | 2 | 3 | 3 | 7 | 1 | 0 | 22 | 2 | 2 | 1 | 3 | 4 | 3 | 3 | 3 | 3 | 2 | 24 |
| 21 | 0 | 0 | 3 | 4 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 3 | 19 | 2 | 2 | 1 | 4 | 5 | 5 | 5 | 1 | 1 | 2 | 23 |
| 22 | 0 | 0 | 2 | 1 | 4 | 1 | 3 | 3 | 3 | 3 | 2 | 1 | 31 | 2 | 2 | 1 | 3 | 5 | 5 | 3 | 2 | 2 | 2 | 27 |
| 23 | 0 | 0 | 1 | 3 | 5 | 0 | 0 | 2 | 2 | 3 | 3 | 3 | 22 | 1 | 1 | 1 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 35 |

149

EXPERIENCE AND TRAINING CHARACTERISTICS IN THE POPULATION

## Teaching Experience in the Population

| Years of Experience | Absolute Frequency | Relative Frequency | Cumulative Frequency |
|---|---|---|---|
| 0 | 30 | 20.8 | 20.8 |
| 1 | 3 | 2.1 | 22.9 |
| 2 | 9 | 6.3 | 29.2 |
| 3 | 6 | 4.2 | 33.3 |
| 4 | 5 | 3.5 | 36.8 |
| 5 | 9 | 6.3 | 43.1 |
| 6 | 8 | 5.6 | 48.6 |
| 7 | 8 | 5.6 | 54.2 |
| 8 | 9 | 6.3 | 60.4 |
| 9 | 10 | 6.9 | 67.4 |
| 10 | 5 | 3.5 | 70.8 |
| 11 | 6 | 4.2 | 75.0 |
| 12 | 6 | 4.2 | 79.2 |
| 13 | 3 | 2.1 | 81.3 |
| 14 | 3 | 2.1 | 83.3 |
| 15 | 3 | 2.1 | 85.4 |
| 16 | 3 | 2.1 | 87.5 |
| 17 | 1 | 0.7 | 88.2 |
| 18 | 1 | 0.7 | 88.9 |
| 19 | 1 | 0.7 | 89.6 |
| 20 | 2 | 1.4 | 91.0 |
| 23 | 3 | 2.1 | 93.1 |
| 24 | 3 | 2.1 | 95.1 |
| 26 | 1 | 0.7 | 95.8 |
| 29 | 1 | 0.7 | 96.5 |
| 31 | 3 | 2.1 | 98.6 |
| 34 | 1 | 0.7 | 99.3 |
| 37 | 1 | 0.7 | 100.0 |
| TOTAL | 144 | 100.0 | |

Appendix D (continued)

### Experience in Teaching Reading in the Population

| Years of Experience | Absolute Frequency | Relative Frequency | Cumulative Frequency |
|---|---|---|---|
| 0 | 73 | 50.7 | 50.7 |
| 1 | 6 | 4.2 | 54.9 |
| 2 | 7 | 4.9 | 59.7 |
| 3 | 8 | 5.6 | 65.3 |
| 4 | 8 | 5.6 | 70.8 |
| 5 | 6 | 4.2 | 75.0 |
| 6 | 4 | 2.8 | 77.8 |
| 7 | 4 | 2.8 | 80.6 |
| 8 | 7 | 4.9 | 85.4 |
| 9+ | 21 | 14.6 | 100.0 |
| TOTAL | 144 | 100.0 | |

### Degree Levels in the Population

| Degree Level | Absolute Frequency | Relative Frequency | Cumulative Frequency |
|---|---|---|---|
| Junior | 3 | 2.1 | 2.1 |
| Senior | 24 | 16.7 | 18.8 |
| B.A./B.A. | 70 | 48.6 | 67.4 |
| Masters | 29 | 20.1 | 87.5 |
| Post M.A. | 11 | 7.6 | 95.1 |
| Specialist | 3 | 2.1 | 97.2 |
| Doctors | 4 | 2.8 | 100.0 |
| TOTAL | 144 | 100.0 | |

Appendix D (continued)

## Area of Specialization (Major) in the Population

| Major Area | Absolute Frequency | Relative Frequency | Cumulative Frequency |
|---|---|---|---|
| Art Ed. | 2 | 1.4 | 1.4 |
| Reading Certification | 28 | 19.4 | 20.8 |
| Elementary Ed. | 54 | 37.5 | 58.3 |
| Home Ec. | 1 | 0.7 | 59.0 |
| Ind. Arts | 2 | 1.4 | 60.4 |
| Lang. Arts/Eng. | 5 | 3.5 | 63.9 |
| Math Ed. | 1 | 0.7 | 64.6 |
| Music Ed. | 2 | 1.4 | 66.0 |
| Physical Ed. | 2 | 1.4 | 67.4 |
| Special Ed. | 8 | 5.6 | 73.0 |
| Social Studies | 4 | 2.8 | 75.8 |
| Administration | 2 | 1.4 | 77.2 |
| Other | 6 | 4.2 | 81.4 |
| Pre-service | 27 | 18.8 | 100.2 |
| TOTAL | 144 | 100.0 | |

Appendix D (continued)

## Number of Reading Courses in the Population

| Reading Courses | Absolute Frequency | Relative Frequency | Cumulative Frequency |
|---|---|---|---|
| 0 | 10 | 6.9 | 6.9 |
| 1 | 33 | 22.9 | 29.9 |
| 2 | 36 | 25.0 | 54.9 |
| 3 | 18 | 12.5 | 67.4 |
| 4 | 9 | 6.3 | 73.6 |
| 5 | 6 | 4.2 | 77.8 |
| 6 | 6 | 4.2 | 81.9 |
| 7 | 7 | 4.9 | 86.8 |
| 8 | 5 | 3.5 | 90.3 |
| 9 or More | 14 | 9.7 | 100.0 |
| TOTAL | 144 | 100.0 | |

# REFERENCES

American Psychological Association. Standards of educational and psychological tests and manuals. Washington, D.C.: Author, 1966.

Artley, A. S., & Hardin, V. B. Inventory of teacher knowledge in reading. Los Angeles: Lucus Brothers, 1971.

Ausubel, D. P., Novak, J. D., & Hanesian, H. Educational psychology--A cognitive view (2nd ed.). New York: Holt, Rinehart and Winston, 1978.

Benham, W. G. Putnam's complete book of quotations. New York: G. P. Putnam and Sons, 1926.

Betts, E. A. Foundations of reading instruction. New York: American Book, 1950.

Blair, T. R. Relationship of teacher effort and student achievement in reading. (Doctoral dissertation, University of Illinois, 1975). Dissertation Abstracts International, 1975, 36, 116A. (University Microfilms No. 75-15, 594)

Bode, B. H. Modern educational theories. New York: Macmillan, 1927.

Bradtmuller, W. G. An investigation of the development of problem solving skills related to teaching reading during student teaching. (Doctoral dissertation, Indiana University, Bloomington, 1963). Dissertation Abstracts, 1964, 24(08A), 3217. (University Microfilms No. 64-01, 671)

Brown, R. E. Teacher skill and other variables associated with effectiveness in teaching reading. (Doctoral dissertation, Indiana University, 1968). Dissertation Abstracts, 1968, 29(06A), 1670. (University Microfilms No. 68-17, 254)

Bruner, J. S. The process of education. Cambridge: Harvard University Press, 1960.

Bruner, J. S. On knowing--Essays for the left hand. Cambridge: Harvard University Press, 1964.

Burnett, R. W. Problem solving proficiency among elementary school teachers V: Diagnostic problem solving in teaching reading. Bloomington: Indiana University Institute of Educational Research, 1961.

Durrell, D. D. Improvement of basic reading abilities. Yonkers on Hudson, New York: World Book, 1940.

Fitts, P. M., & Posner, M. I. Human performance. Belmont, California: Brooks/Cole, 1967.

Gronlund, N. E. Constructing achievement tests (2nd ed.). Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

Harris, A. J. How to increase reading ability (5th ed.). New York: David McKay, 1970.

Harris, A. J., & Morrison, C. The craft project: A final report. The Reading Teacher, 1969, 22, 335-340.

Helwig, J. T., & Council, K. A. (Eds.) SAS user's guide. Cary, North Carolina: SAS Institute, 1979.

Kerlinger, F. N. Foundations of behavioral research (2nd ed.). New York: Holt, Rinehart and Winston, 1973.

Kingston, A. J., Brosier, G. F., & Hsu, Y. The inventory of teacher knowledge of reading--A validation. The Reading Teacher, 1975, 29, 133-136.

Lamb, P., & Arnold, R. Reading: Foundations and instructional strategies. Belmont, California: Wadsworth Publishing, 1976.

Lewis, A. J., & Meil, A. Supervision for improved instruction. Belmont, California: Wadsworth Publishing, 1972.

Powell, W. R. Selecting objectives for the first course in reading. Paper presented at the Annual Convention of the International Reading Association, Boston, 1968.

Powell, W. R. From diagnosis to instruction--The i-p model. Paper presented at the Annual Convention of the International Reading Association, New York, 1975a.

Powell, W. R. Determining the feasibility of an annual commissioner's report of the mastery of basic skills by Florida citizens: Basic literacy and basic skills (Tech. Rep. No. 1). Tallahassee: Florida Department of Education, 1975b.

Powell, W. R. A study of relationships in teacher proficiency. In W. D. Miller & G. H. MeNinch (Eds.), Reflections and investigations on reading: Twenty-fifth Yearbook of the National Reading Conference, 1976, 154-160.

Powell, W. R., Bengston, J., Bolduc, E. J., Crews, R., Wenzel, E., & Weathers, J. S. Project to improve education in the basic skills: Indicators of teacher performance in the basic skills (Tech. Rep. No. 4). Tallahassee: Florida Department of Education, 1978.

Powell, W. R., Bolduc, E. J., Crews, R., Kantowski, M., Smith, L. L.,
& Wenzel, E. Project to improve education in the basic skills:
Specifying basic skills (Tech. Rep. No. 2). Tallahassee: Florida
Department of Education, 1976.

Powell, W. R., Bolduc, E. J., Crews, R., Kantowski, M., Smith, L. L.,
& Wenzel, E. Project to improve education in the basic skills:
Teacher competencies and indicators for learning (Tech. Rep. No. 3).
Tallahassee: Florida Department of Education, 1977.

Ramsey, W. S. An evaluation of three methods of teacher reading. In
J. A. Figurel (Ed.), Challenge and Experiment in Reading: Proceed-
ings of the Annual Convention of the International Reading Associ-
ation. Chicago, 1962, 7, 153.

Stoll, P. D. The construction and initial validations of an instrument
designed to assess problem solving proficiency in the teaching of
reading. (Doctoral dissertation, University of Illinois, 1971).
Dissertation Abstracts International, 1972, 32(10A), 5661.
(University Microfilms No. 72-12, 339)

Turner, R. L. The acquisition of teaching skills in elementary school
settings. Bulletin of the School of Education, Indiana University,
1965, 41, n.p.

Turner, R. L., & Fattu, N. A. Skill in teaching assessed on the cri-
terion of problem solving. Bulletin of the School of Education,
Indiana University, 1961, 37(3), n.p.

Tyler, R. W. Basic principles of curriculum and instruction.
Chicago: University of Chicago Press, 1949.

Wade, E. W. The construction and validation of a test of ten teacher
skills used in reading instruction, grades 2-5. (Doctoral disser-
tation, Indiana University, Bloomington, 1960). Dissertation
Abstracts, 1960, 22(01), 167. (University Microfilms No. 60-06,
071)

Wade, E. W. Problem solving proficiency among elementary school
teachers III, teachers of reading grades 2-5. Bloomington:
Indiana Institute of Educational Research, 1961.

BIOGRAPHICAL SKETCH

The author, son of Mr. and Mrs. T. R. Weathers, was born in Jacksonville in 1947. He attended public schools in Florida and graduated from Ribault Senior High School in Jacksonville in 1965.

Prominent in North Florida golf competition during high school, he entered the University of Florida on a golf scholarship in 1965. A member, and past president, of Kappa Sigma Fraternity, the author was active in student athletics and politics during the late 1960's and was inducted into membership in Florida Blue Key and Order of Omega, honorary leadership fraternities at the University.

In 1969 he moved to Sarasota, Florida, to participate in the State's first year-long internship program. After graduating in 1970, with a Bachelor of Arts in Education degree, he remained at Sarasota Junior High as a teacher, curriculum and staff development specialist.

In 1973 the author returned to his alma mater to begin his graduate work. After obtaining his Master of Education in 1974, he began his doctoral program and was admitted to candidacy in 1978.
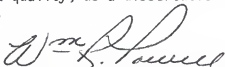
While preparing his doctoral research study, he developed a Title I reading laboratory at Newberry Junior High School, outside of Gainesville, Florida, and later served as chairman of the English Department.

In 1978, he accepted a parttime teaching position in compensatory education at Buchholz High School and also served as a graduate research assistant and teaching assistant at the University of Florida.

In 1979, under a unique Teacher Education Center Program sponsored by the Duval County Schools, the author accepted a position with the University of North Florida to provide fulltime consultant assistance to the public schools in designing and implementing the inservice programs in compensatory education and developmental reading laboratories for secondary school students.
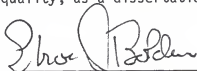
The proud father of two children, Jeffrey Scott, Jr., 12, and Jennifer April, 8, the author presently resides with his wife, Cora Lee, in his hometown of Jacksonville, where he is currently in his third year with the Teacher Education Center Program.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
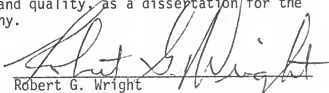
William R. Powell, Chairman
Professor of Instructional Leadership
  and Support

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.
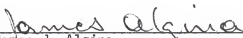
Elroy J. Bolduc
Professor of Subject Specialization
Teacher Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Robert G. Wright
Associate Professor of Subject
  Specialization Teacher Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philsophy.

Janet J. Larsen
Professor of Counselor Education

This dissertation was submitted to the Graduate Faculty of the Division of Curriculum and Instruction in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May, 1982

Dean for Graduate Studies and Research